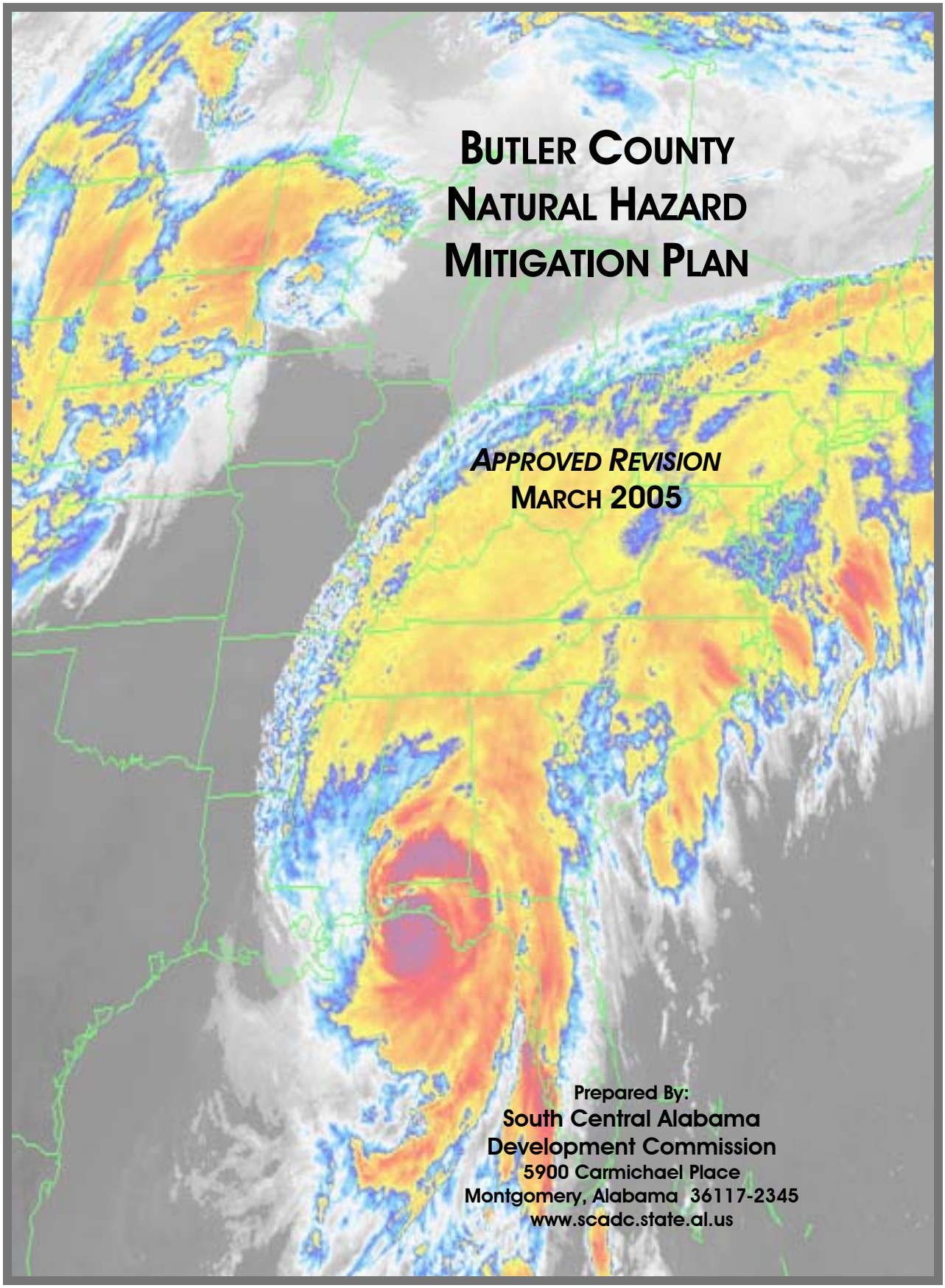

BUTLER COUNTY NATURAL HAZARD MITIGATION PLAN

APPROVED REVISION
MARCH 2005

Prepared By:
South Central Alabama
Development Commission
5900 Carmichael Place
Montgomery, Alabama 36117-2345
www.scadc.state.al.us

Butler County Natural Hazard Mitigation Plan

Approved Revision
March 2005

Adopted by:
Butler County Commission, August 9, 2004
Town of Georgiana, August 3, 2004
City of Greenville, August 9, 2004
Town of McKenzie, August 2, 2004

FEMA Approved On:
March 22, 2005

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Additional copies of the Butler County Natural Hazard Mitigation Plan are available by contacting: **Butler County Emergency Management Agency**
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I. PURPOSE AND PROCESS

Natural hazard mitigation is the process of reducing or eliminating the loss of life and property damage resulting from natural disaster events. This process begins with the hazard mitigation plan in which hazards are identified and analyzed to determine their potential impact on a community or region and steps are outlined to avoid or minimize the undesired effects. The purpose of the hazard mitigation plan and planning process is the resulting mitigation strategy, which outlines a coordinated implementation of action steps with as little conflict and/or duplication of efforts as possible by the responsible agencies.

The Butler County Natural Hazard Mitigation Plan is multi-jurisdictional in scope, covering Butler County in its entirety including the unincorporated areas and the municipalities of Georgiana, Greenville, and McKenzie. Thus, this plan has been reviewed and is being approved by the County Commission and the three municipal governments located within the county. During the planning process, the following three goals were established to guide mitigation efforts:

- Promote natural hazard mitigation as a means to decrease loss of life, property damage, and economic loss during a disaster occurrence.

- Provide on-going support of the Butler County Emergency Management Agency's efforts to make Butler County less vulnerable to natural disasters.

- Educate the general population about natural hazards and hazard mitigation options.

To develop the Butler County Natural Hazard Mitigation Plan, the Butler County Local Emergency Planning Committee (LEPC) was utilized as an oversight committee to guide the development of the plan and lend individual expertise to the planning process. The Butler County LEPC is a standing committee comprised of 40 members representing emergency services, the County Commission, each of the three municipal governments, law enforcement, medical services, utilities, education, business and industry, forestry, agriculture, social services, and the media. The plan was developed using a ten-step process outlined by the Federal Emergency Management Agency. More detail about the planning process, public involvement, and meeting summaries can be found in Appendix A.

Figure 1

Hazard Mitigation
10-Step Planning Process

Step 1:	Organize
Step 2:	Involve the Public*
Step 3:	Coordinate with Agencies and Organizations*
Step 4:	Assess the Hazard
Step 5:	Assess the Problem
Step 6:	Set Goals
Step 7:	Review Possible Activities
Step 8:	Draft an Action Plan
Step 9:	Adopt an Action Plan
Step 10:	Implement, Evaluate and Revise**

* Step 2 and Step 3 are continuous throughout the process.

** Upon evaluation and revision, the process should begin again at Step 2. Evaluation and revision of the plan should occur at least every five years.

During the course of the planning process, the Local Emergency Planning Committee met on three occasions to discuss progress and provide information and comments. Additionally, two public workshops were held to educate the general public about the hazard mitigation plan and its contents and recommendations, and to hear citizens' comments and suggestions. Notification of the public workshops was accomplished with newspaper coverage and posting of meeting flyers in various public locations throughout Butler County. Following the second public workshop, citizen comments were used to finalize the plan and it was delivered to the Butler County Commission, and the municipal councils of the Towns of Georgiana and McKenzie, and the City of Greenville for review and comments. The plan was then submitted to the Alabama Emergency Management Agency for review, comments and revisions prior to adoption by the local governments in Butler County. Documentation of the adoption of the plan can be found in Appendix A.

As part of the planning process, a review was conducted of known historical and current plans, ordinances, and studies that were prepared for the County and its municipalities. These plans were researched for ideas and relevance in terms of disaster mitigation and preparedness, and a short list of findings were presented, which concluded that there was especially little data or information directly related toward hazard mitigation found in the reviewed documents. The information found in these plans was used to help identify hazards and risks, determine vulnerabilities, and provide ideas for mitigation strategies and activities. A description of this review and the results can be found the Hazard Identification chapter and Appendix A.

The public involvement process allowed a specialized committee (the Butler County Local Emergency Planning Committee) with specific ties in terms of both benefits and responsibilities to work directly on the preparation of the mitigation plan, providing suggestions from both an individualized, or agency, perspective and for the overall welfare of the citizens of Butler County. Following the committee

meetings with public workshops and review by the local governments insured that the citizens were aware of the process, had ample opportunity to comment, and that the plan was not biased in the direction of any one agency or segment of the population.

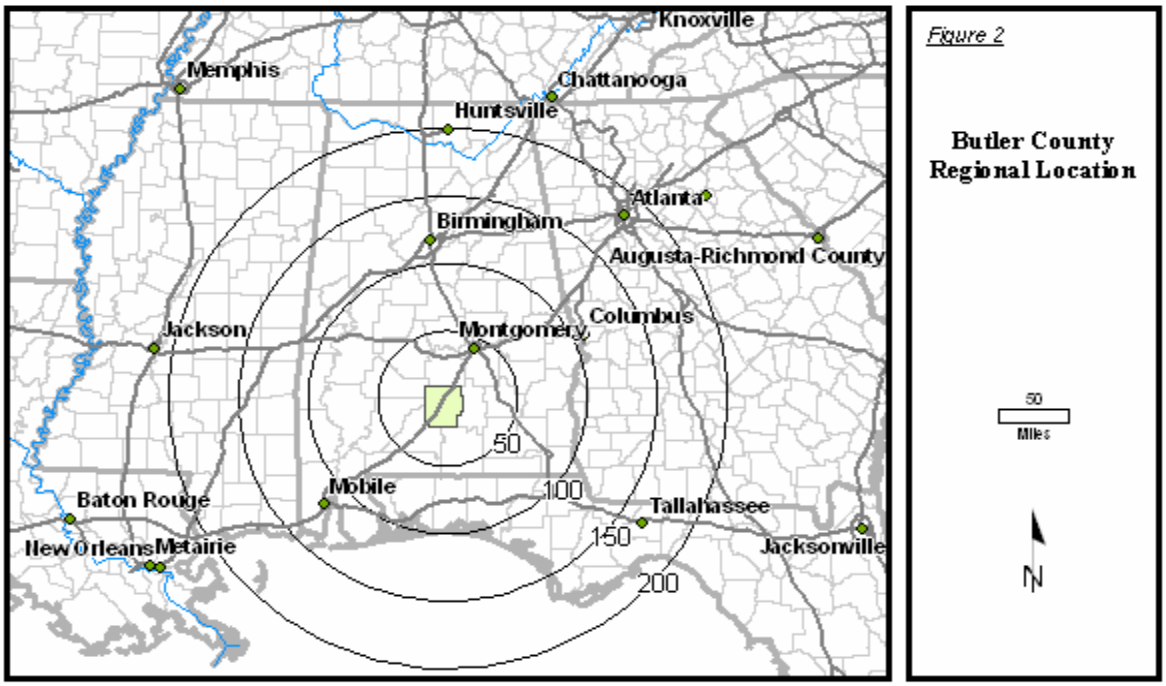
Following the ten-step process, an inventory was made of Butler County to determine the physical characteristics of the area, development and land use patterns, and demographics. The inventory was followed by identification of natural hazards and their potential impact on Butler County, coupled with an investigation of previous disaster events. With this information at hand, the LEPC was able to determine those hazards that are most likely to impact Butler County and cause the most severe damage. The LEPC identified seven natural hazards that became priority one hazards, meaning they were most likely to occur more often and/or have the most severe impact on Butler County and the citizens that live there. From this point, it was possible to identify those facilities that are critical in terms of disaster recovery or disaster impact and outline measures to be taken to protect them, or at least minimize damage, in the event of a natural hazard occurrence. These measures became the mitigation strategy portion of the Butler County Natural Hazard Mitigation Plan. The final parts of the plan include an implementation schedule and a plan to review and maintain the Butler County Natural Hazard Mitigation Plan on a regular basis.

As mentioned previously, each adopting jurisdiction (i.e., the County Commission and the three municipalities) was invited to participate and send representatives to the Butler County LEPC. Representatives from each of the jurisdictions did participate by: attending the LEPC and/or public meetings; reviewing drafts of the Butler County Natural Hazard Mitigation Plan; submitting suggestions and information for inclusion in the Plan; and/or by formal adoption (via resolution) of the Butler County Natural Hazard Mitigation Plan.

Implementation of the Butler County Natural Hazard Mitigation Plan will be shared by all local governments in the county, along with a number of emergency agencies and responders. The on-going review and evaluation will allow the Butler County Emergency Management Agency to revise and update the mitigation plan in response to changing conditions and changes in the economic climate that may have an impact on the provision of facilities and services.

II. COMMUNITY PROFILE

Butler County, located in south central Alabama, is a primarily rural county with three incorporated municipalities: Georgiana, Greenville, and McKenzie. Greenville, located in the north central part of the county, is the county seat. Butler County is located within 50 miles of Montgomery, Troy, and Selma. Major Alabama cities within a 200-mile radius include Birmingham, Dothan, Huntsville, Mobile, and Tuscaloosa. Other cities within a 200-mile radius include Atlanta, Columbus, and Macon, Georgia; Meridian and Biloxi, Mississippi; and Fort Walton, Panama City, Pensacola, and Tallahassee, Florida. Butler County encompasses 779 square miles of land and is accessed by Interstate 65, which bisects the county from its northeast corner to its southwest corner. Butler County also has regional access by U.S. Highway 31and Alabama Highways 10, 106, 185, and 263. A CSX rail line also bisects the county, running virtually parallel with Interstate 65 and U.S. Highway 31. Another CSX rail line runs from McKenzie northwest to Georgiana.



Butler County is fairly sparsely populated with a population density of 27.5 persons per square mile, as compared to the State of Alabama with 87.6 persons per square mile. Approximately a third of the county's population lives in the City of Greenville.

Figure 3

Butler County Population, 2000

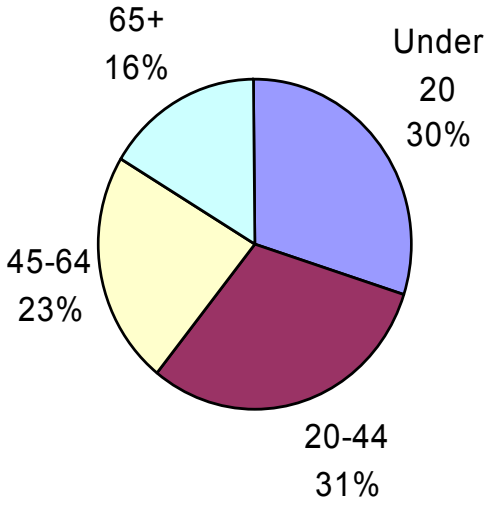
Area	Population	% of Total Population
Butler County	21,399	100%
Georgiana	1,737	8%
Greenville	7,228	34%
McKenzie	644	3%
Unincorporated Area	11,790	55%

Source: U.S. Census Bureau, Census 2000

Butler County has a population of 21,399 persons, according to the 2000 Census, of which nearly half, at 55 percent, live in the unincorporated areas of the county. Of the remaining 45 percent, 34 percent live in the City of Greenville; 8 percent live in the Town of Georgiana; and, 3 percent live in the Town of McKenzie. The majority of the population of Butler County is female, at 53 percent, and 47 percent are male. The female ratio of Butler County is slightly higher than that of the State, which is 51.7 percent.

Figure 4

2000 Population by Age

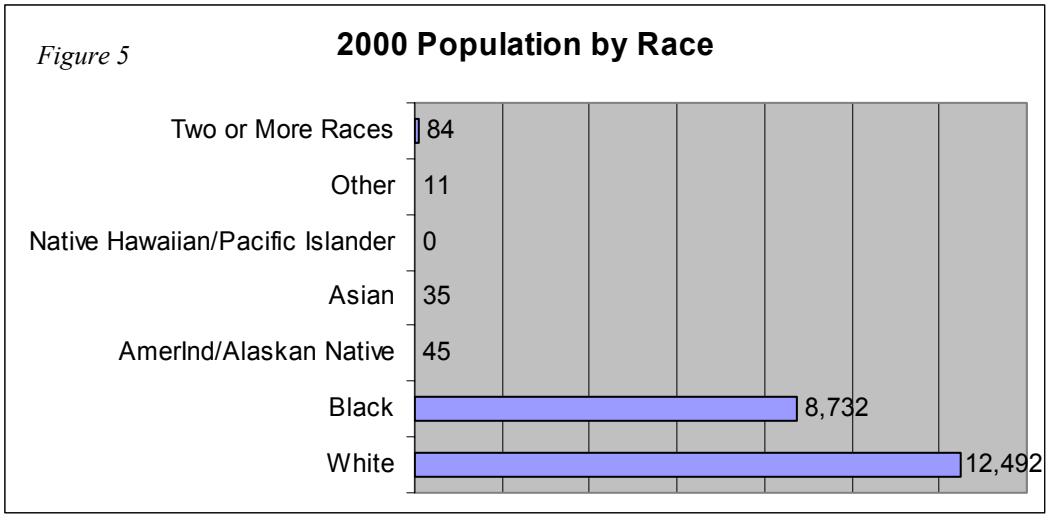


The median age in Butler County is 37.7, which is older than the median age of the State, at 35.8. The median age of Greenville is 38.1, while the median age in the other municipalities is considerably older, at 40.1 in Georgiana and 40.6 in McKenzie. The majority of the county population, at 31 percent, is between 20-44 years of age, while the elderly population, age 65 and older, comprises only 16 percent. The remaining 53 percent of the population is under the age of 20 (at 30 percent) or between the ages of 45 to 64 (at 23 percent).

According to the 2000 Census, 58.4 percent of the total county population is white; 40.8 percent is black/African-American. The racial composition of other races in

Butler County is nearly negligible, with all other races combined only comprising 0.8 percent of the total population.

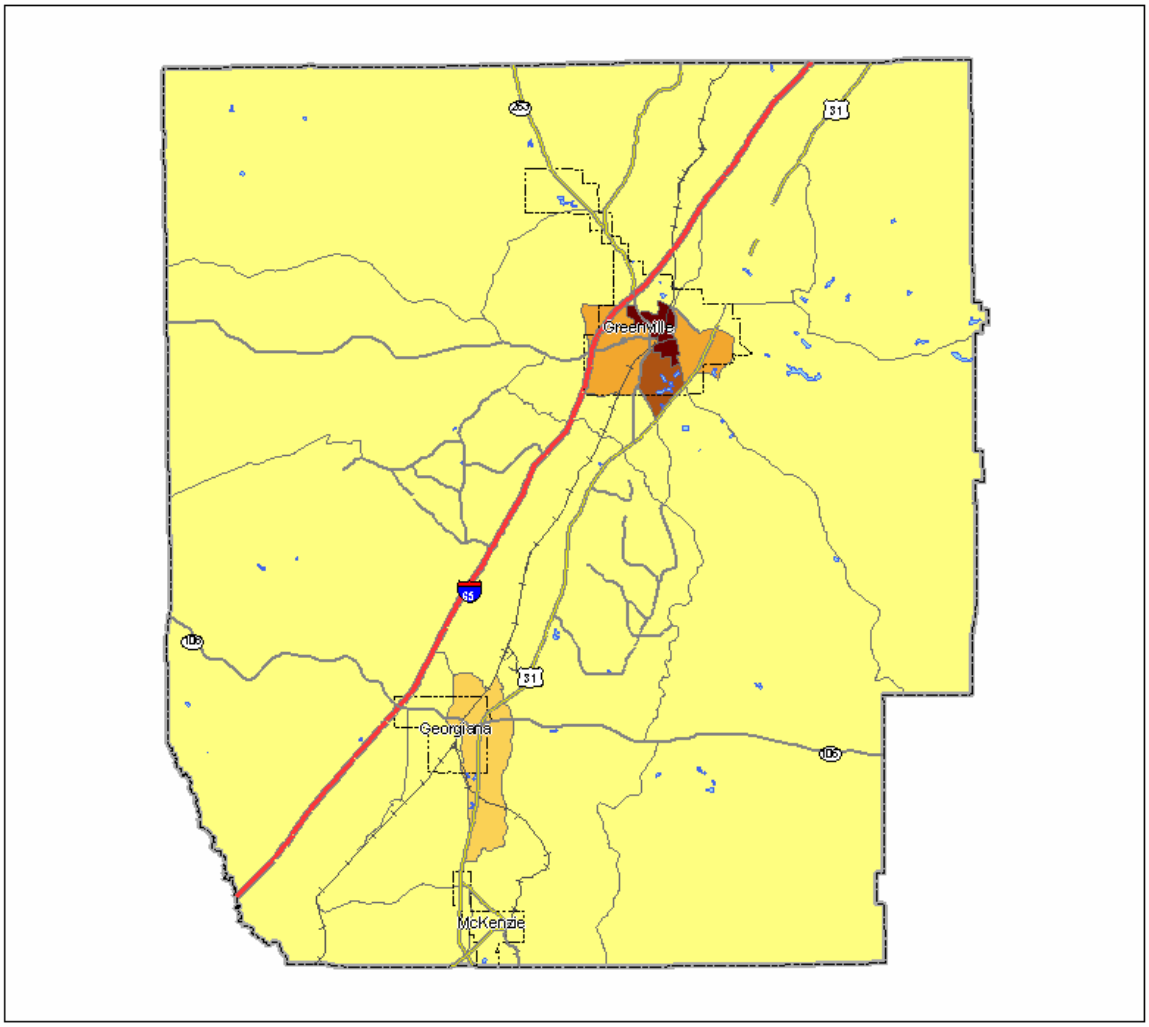
Figure 5



There are 9,957 housing units in Butler County, the majority of which, at 33.4 percent, are located in the City of Greenville. As shown in Figure 6, the north central part of the county in southern Greenville is, by far, the most densely populated portion of the county with the remainder of the county having 50 housing units or less per square mile. Of the total housing units in the county, 84.3 percent are occupied and 15.7 percent are vacant, of which 2.7 percent are for seasonal, recreational or occasional use. Of the total occupied housing, 76.2 are owner-occupied and 23.8 percent are renter-occupied. The majority of the housing units in Butler County, at 62.8 percent, are single unit unattached structures. Only 6.8 percent of the housing structures have four or more units. The portion of the housing structures that are mobile homes is 26.5 percent. A large portion of the county's housing stock, at 42 percent, is more than 30 years old having been built prior to 1970. Between 1995 and March 2000, 1,621 new housing units were constructed, comprising 16.2 percent of the existing housing stock.

Figure 6

Housing Units Per Square Mile



0 1.25 2.5 5 7.5 10
Miles

N

Prepared May 2004

Housing Units / Square Miles
- 3.278 - 50.00
- 50.01 - 100.0
- 100.1 - 200.0
- 200.1 - 500.0
- 500 - 1,080

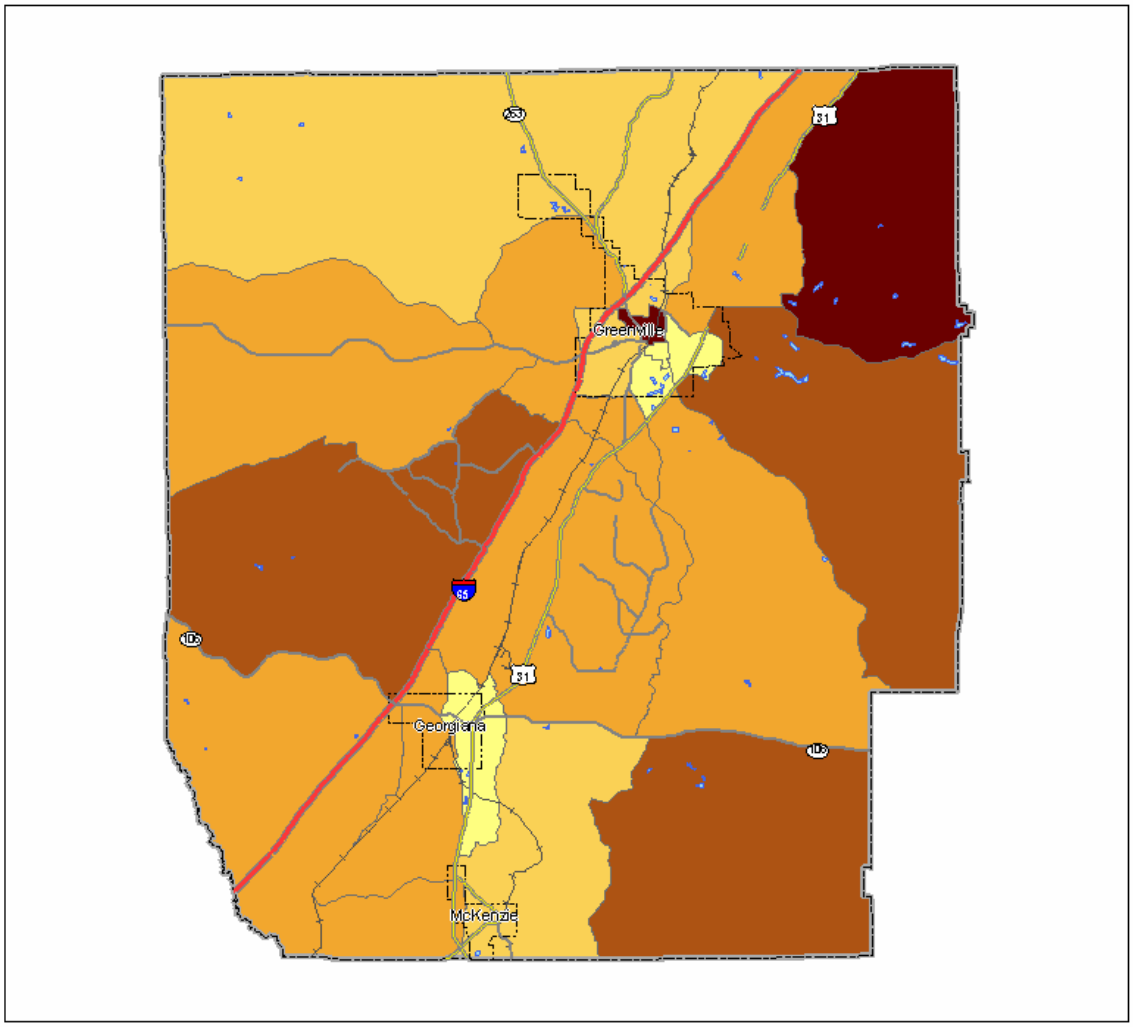
CFCC Road Class
- Limited Access
- Primary
- Secondary
- Butler Co. Railroads
- Butler Co. Boundary
- Butler Co. Municipalities
- Butler Co. Water Bodies

Note: This map is based on Census 2000 Block Groups.

Sources: U.S. Census 2000, SF1; Census Bureau TIGER/Line Files 2000; and local sources.

Figure 7

Median Household Income



Butler County, overall, has a per capita income of $15,715 and a median household income of $24,791, according to the 2000 Census. This is considerably less than that of the State, which has a 2000 per capital income of $18,189 and a 2000 median household income of $34,135. Comparatively, the Town of Georgiana has a per capita income of $10,166 and a median household income of $17,014; the City of Greenville has a per capita income of $17,439 and a median household income of $22,106; and the Town of McKenzie has a per capita income of $10,359 and a median household income of $18,173. The portions of the county with the lowest median income, as shown in Figure 7, are in east Georgiana and southeast Greenville with a median income of less than $16,000.

It makes sense that the population base is located along the major transportation axes of the county when viewed from a geographical standpoint. As shown in Figure 8, most the regional access is located in the central parts of the county, while the western and eastern extremes are comprised primarily of county roads. General land use patterns (Figure 9) also follow the transportation system, with the majority of structural development being located along the Interstate 65 / U.S. Highway 31 corridor.

Figure 8

Regional Access

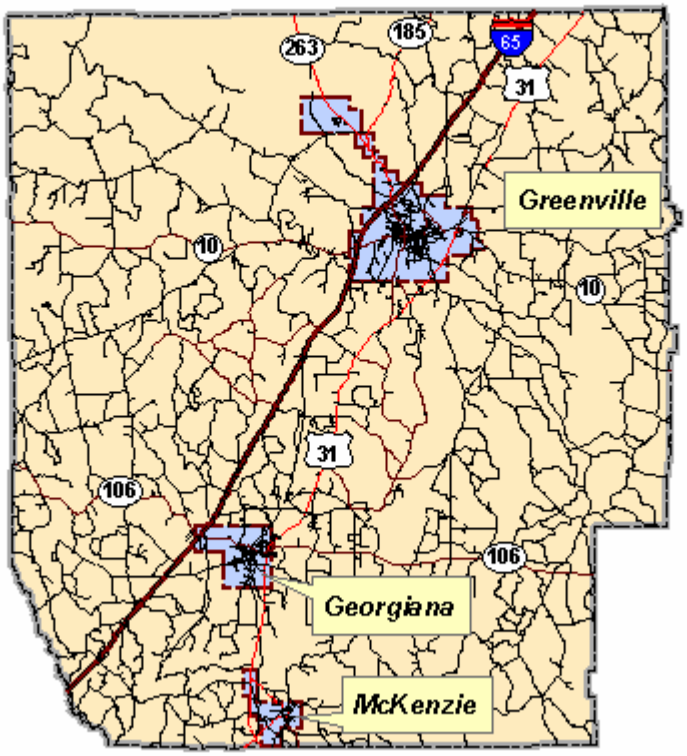
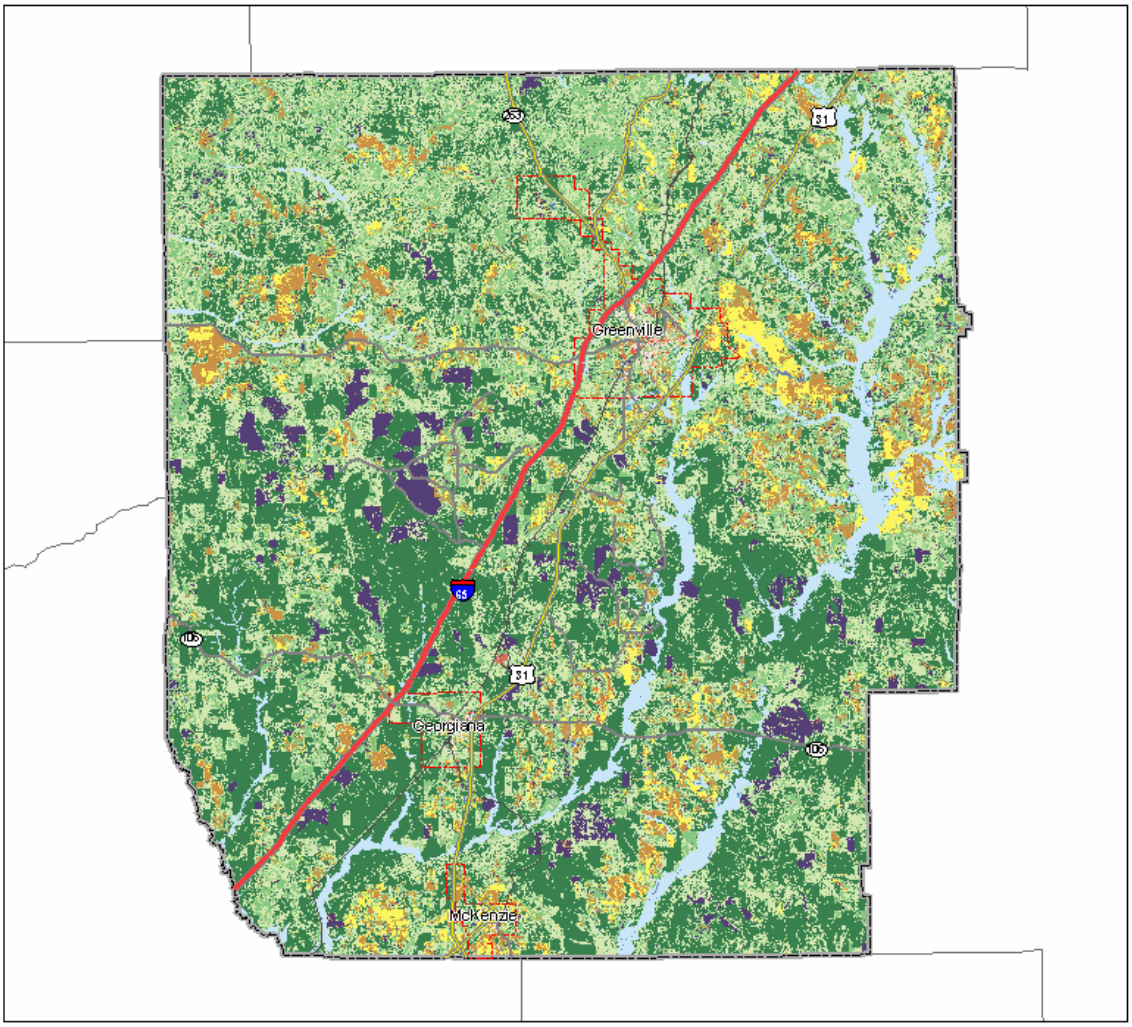


Figure 9

Land Use & Land Cover



Prepared May 2004

Sources: USGS, Alabama Land Cover Data Set, 1999; Census Bureau TIGER/Line Files 2000; and local sources.

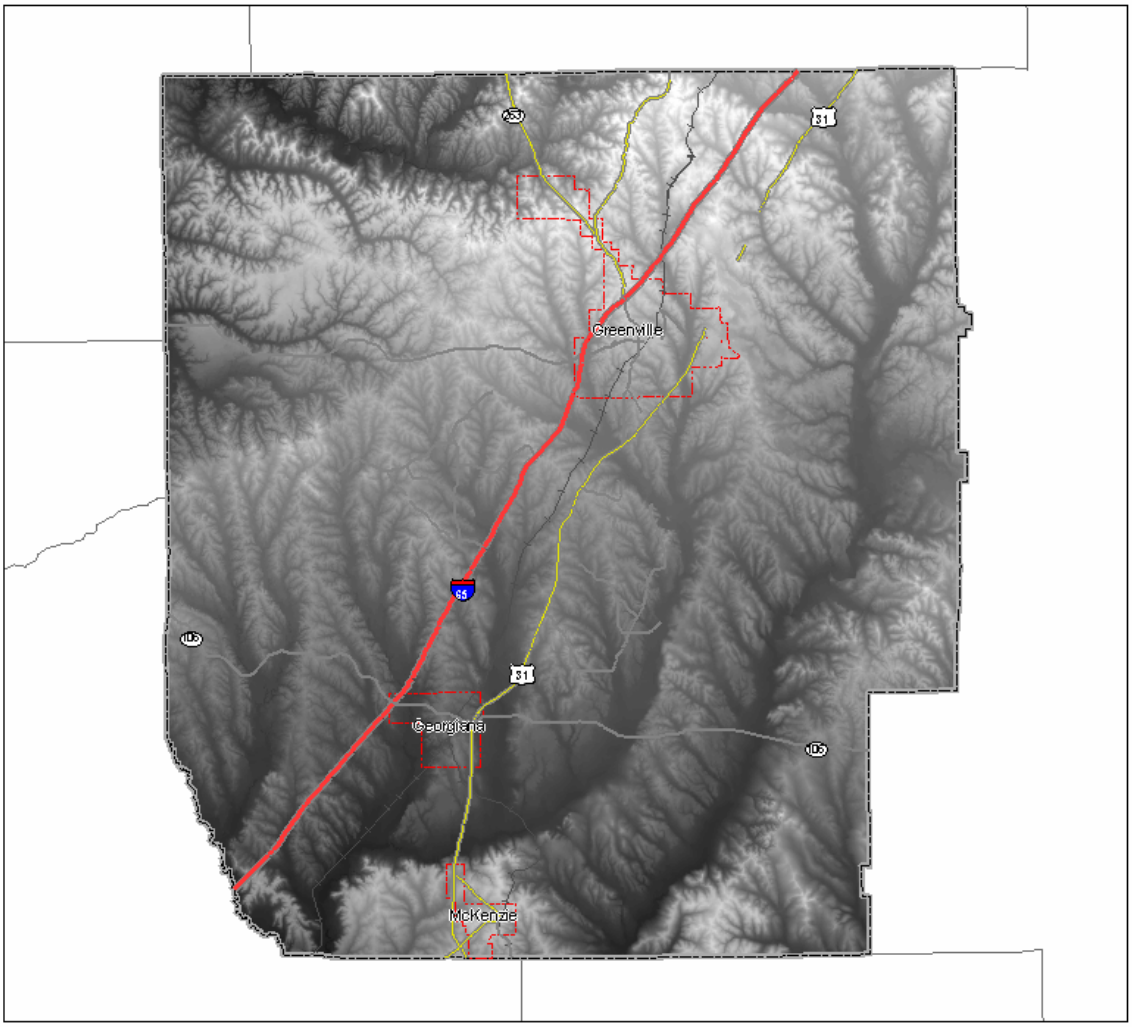
Residential land uses throughout Butler County tend to be low density single family housing, with a small percentage of medium and high density housing found in the Greenville area. As stated earlier, 26.5 percent of the housing in the county is mobile homes, most of which (at 84.5 percent) are found in the unincorporated areas on single ownership lots or tracts of land. The land use / land cover map does not show any high intensity residential uses outside of the City of Greenville.

Agricultural uses in Butler County are primarily livestock and poultry and timberland. Of the total 498,650 acres in Butler County, 79 percent is in forestland and 20 percent is used for crops and livestock. Forested land is located throughout the county, but primarily in the southern half. The most concentrated areas in crop and pasture land uses are found in the northern half of the county.

Butler County has a well developed system of natural drainage. The northwestern part of the county is in the Alabama River Basin, and the remainder of the county is in the Conecuh River Basin. The Sepulga River, Persimmon Creek, and Pigeon Creek are the principal streams. They are potential sources of large supplies of surface water. Other important streams include Long Creek, Panther Creek, Rocky Creek, Pine Barren Creek, Cedar Creek, and Wolf Creek. Sherling Lake is the largest area of open water in the county. Ground water is the source of most of the water for domestic and industrial uses in Butler County. The principal aquifers are sand beds in the Eutaw, Ripley, and Nanafalia Formations and limestone beds in the Clayton Formation. Floodplains are found primarily along the Long, Persimmon, and Pigeon Creeks and their tributaries. The existing floodplains are linear in nature and generally are not expansive in width, with the widest floodplains being approximately one to one and a half miles wide. There are a significant number of tributaries feeding the primary creeks in the county; however, floodplains along the tributaries are minimal in size.

Figure 10

Digital Elevation Model

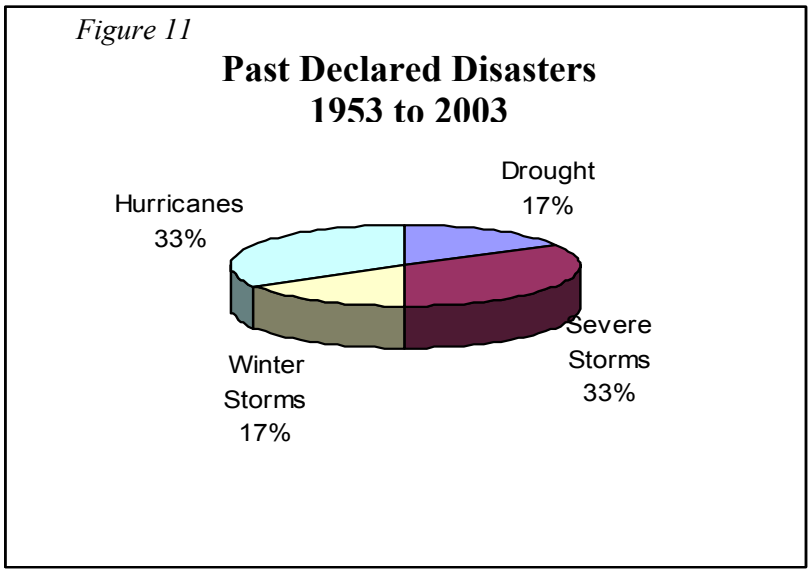


III. HAZARD IDENTIFICATION

Natural hazards that have the potential to impact Butler County were identified using a variety of resources. First, an overall list of natural hazards was obtained from Federal Emergency Management Agency Publication 386-2 which is a state and local mitigation planning how-to guide entitled: *Understanding Your Risks – Identifying Hazards and Estimating Losses*. Using the general list of natural hazards, research was conducted into past disaster occurrences in Butler County and the physical characteristics of the county that lend themselves to natural hazard occurrences, along with a review of historical and existing plans and regulations in Butler County that identify the potential for natural hazards.

In an initial review of the list of natural hazards, five of the 19 listed hazards were eliminated due to a lack of applicability in Butler County. The five hazards that were eliminated were avalanche, coastal erosion, coastal storm, tsunami, and volcano. The list of the remaining 15 hazards was then utilized to identify which hazards had a true potential to impact Butler County. The 15 hazards (some of which were combined) that were researched include: dam failure, drought, earthquake, expansive soils / land subsidence, extreme heat and drought, flood, hurricane / tropical storm, landslide, winter storm, tornado, wildfire, and severe thunderstorm / lightning / hail / high winds. A review of past disaster declarations (available through FEMA) in Butler County revealed that the most frequent declared natural disasters between 1953 and 2003 have been severe thunderstorms and hurricanes, each at 33 percent of all declared disasters. Other disaster declarations were for drought and a winter storm.

Figure 11



Of the six disaster events during the 50-year period, all were federal declarations. The dates and types of occurrences are shown in Figure 12. In each of the six federal declarations, federal assistance was provided to Butler County in the following manner: both public and individual assistance was provided in six declarations; only public assistance was provided in two declarations; and, only individual assistance was provided in one declaration. Beyond financial assistance, federal assistance was provided in the form of crisis counseling, disaster housing, disaster unemployment assistance, and individual, and family grants.

Figure 12

Past Declared Disasters, 1953 to 2003
50 Years

Date	Hazard	Declaration
July 1977	Drought	Federal Declaration
March 1990	Severe Storm	Federal Declaration
March 1993	Winter Storm	Federal Declaration
October 1995	Hurricane – Opal	Federal Declaration
September 1998	Hurricane – Georges	Federal Declaration
December 2001	Severe Storm	Federal Declaration

Source: Federal Emergency Management Agency, April 2004

Information available through the National Climatic Data Center (NCDC) and the National Weather Service (NWS) – both agencies of the National Oceanographic and Atmospheric Administration (NOAA) – show that Butler County suffered a total of 117 weather events between January 1950 through December 2003, which is an average of 2.34 events per year. The most frequent weather event during the 53-year time period were severe thunderstorms / hail / wind storms, with 82 occurrences resulting in a total of $289,000 in property damage. Thunderstorms and wind storms were followed by tornados, with 24 events resulting in over $1 million in property damage, two fatalities, and 14 injuries. Of the remaining weather events profiled by the NCDC during the same period, Butler County suffered 18 tornados, one winter storm, three heavy rain / flash floods, one heat and one drought event, and three tropical cyclones. Although they occur less frequently, the NCDC information shows that Hurricanes Opal and Georges and Tropical Storm Barry were, by far, the most costly to the county, resulting in an estimated $222.6 million and $9 million in property and crop damages, respectively, and the loss of one life.

Flooding in Butler County is most likely to occur in the floodplain areas found along the three major streams. Butler County does not have a history of the severe flooding that is found in low elevation areas such as Elba, Alabama. But, local

residents report occasional flash flooding and road washing and erosion as a result of heavy rains and localized flash floods. Per NCDC data, six flood events occurred in the county from 1997 through 2001 that resulted in $825,000 in property damage. Floodplains in Butler County are shown in Figure 13. The floodplain areas tend to be narrow and linear in nature, following stream beds and to some degree larger tributaries of the Long, Persimmon, Pigeon, Cedar, and Rocky Creeks. The floodplains are not expansive, with the widest areas being approximately one and one and half miles in width.

Information available from the Geological Survey of Alabama (GSA) shows that Butler County has never been impacted by an earthquake in their reporting period from 1916 through 2003. GSA information also reveals that Butler County has a low incidence probability of landslides occurring in the county, as shown in Figure 15. Additionally, there are outcrops of carbonite rocks in the northern third of Butler County, making the area susceptible to sinkholes, however, Butler County does not have currently have active sinkholes and land subsidence.

Eight tropical cyclones have traversed Butler County during the 150-year period from 1851 through 2001. As shown in Figure 15, six of the eight tracks of the tropical cyclones were minor tropical, extratropical, or subtropical storms or depressions. However, two H1 tropical hurricanes have occurred in the county in the referenced time period.

A review of historical and existing plans and regulations for Butler County and its municipalities revealed that there is very little current information that is directly related to hazard identification or natural hazard mitigation. Existing information does include limited police and fire protection services and needs; and statements as to the need for road and bridge improvements, and limitations to development in flood-prone areas. The review of past and existing plans shows that the potential for disaster events must have received some consideration in past growth and development planning for the county, which is evident in the relative lack of development that has occurred in the flood-prone areas of the county. This review also resulted in a short list of available tools that can be utilized to facilitate or complement current and future hazard mitigation activities. These tools include flood damage prevention ordinances, storm water management guidelines, subdivision regulations, zoning ordinances, capital improvement programs, and proposed dangerous buildings ordinances.

Figure 13

Floodplains

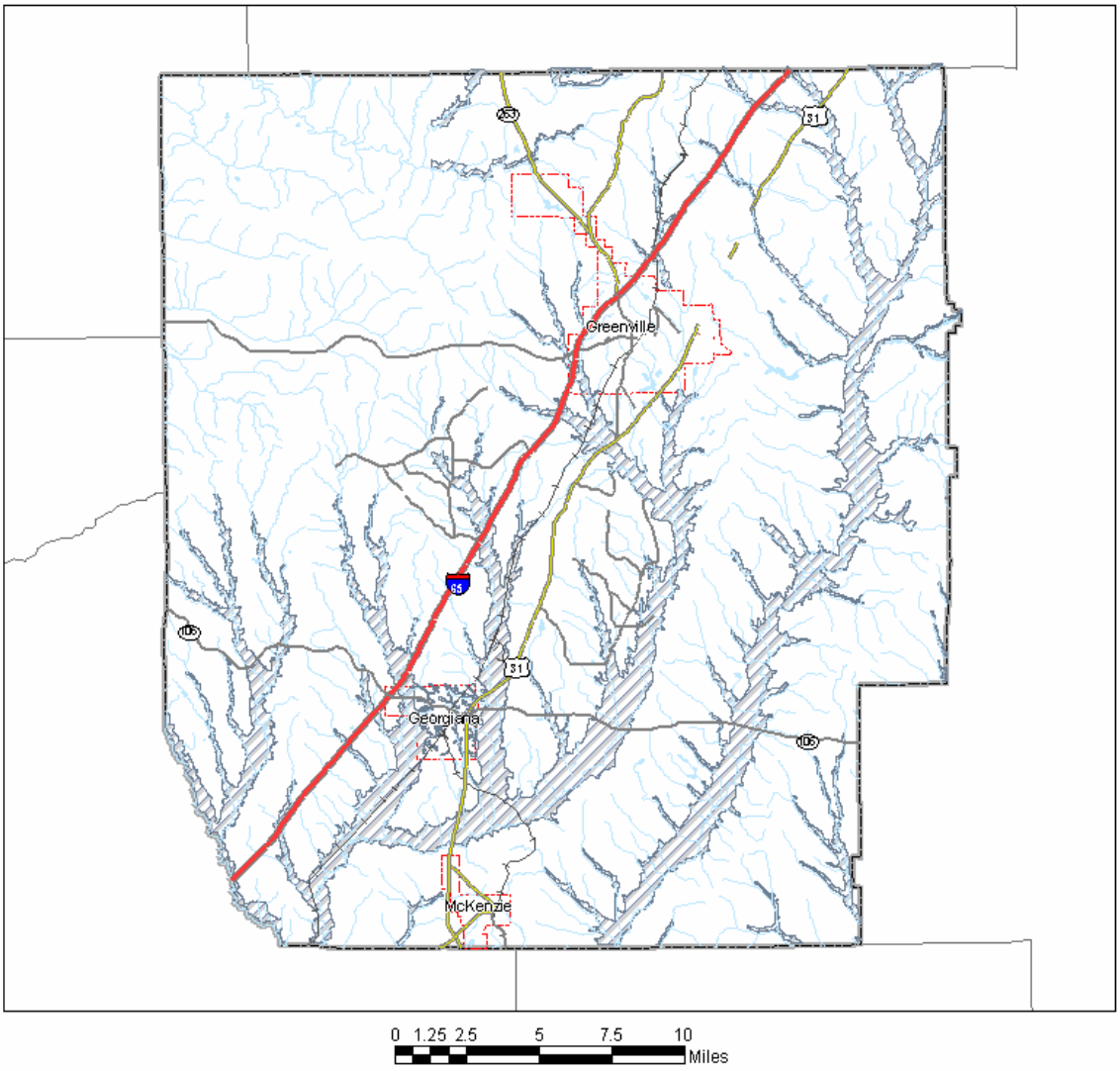


Figure 14

Landslide Potential

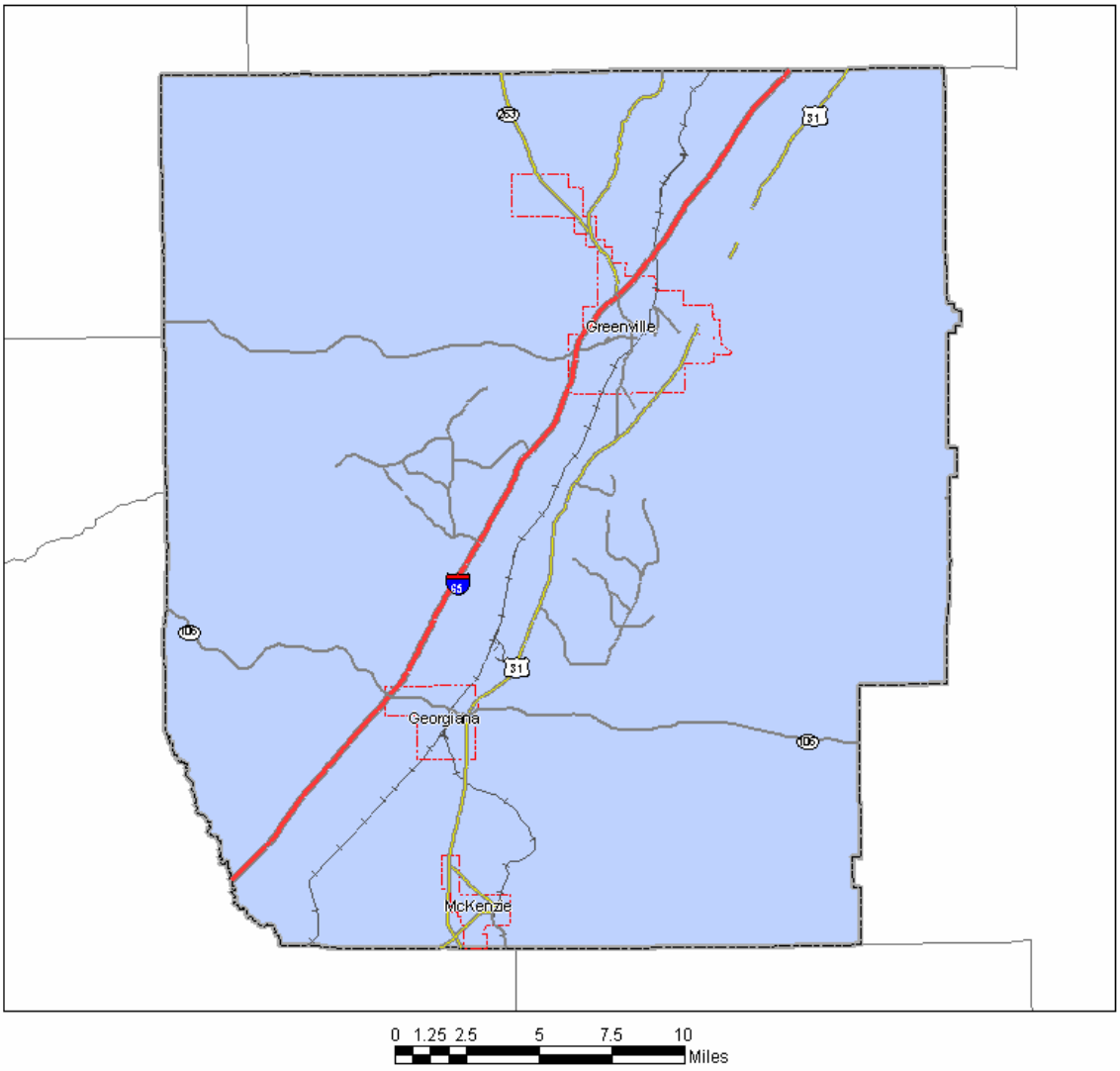
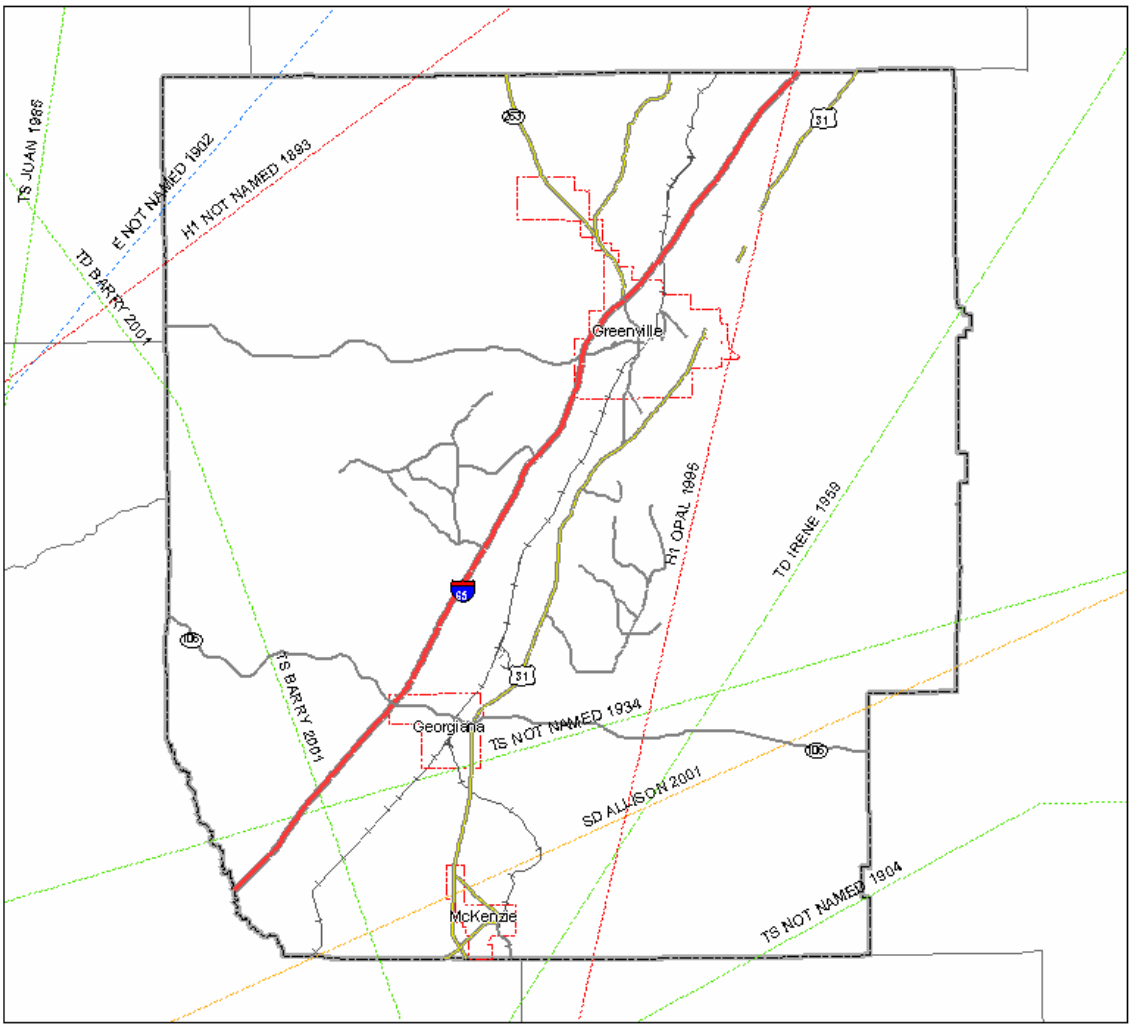


Figure 15

Tropical Cyclones



Sources: NOAA, Tropical Prediction Center/National Hurricane Center, Historical North Atlantic Cyclone Tracks 2002; Census Bureau TIGER/Line Files 2000; and local sources.

Historical plans that were reviewed include: Alabama Economic Enhancement Strategy – Butler, Monroe, and Wilcox Counties, 1991; Areawide Plan: Fire Protection Study, 1974; Areawide Study: Environmental Assets, 1975; Areawide Plan: Rural Land Use Analysis, 1977; Areawide Study: Environmental Review Manual, 1977; Areawide Land Development Plan, 1978; Butler County Industrial Sites Location and Community Environment, 1975; Butler County Rural County Highway Development Plan, 1992; Georgiana Land Development Plan, 1973; Georgiana Community Facilities Plan, Public Improvements Program, and Capital Improvements Budget, 1974; Greenville Land Development Plan, 1973; Greenville Community Facilities Plan, Public Improvements Program, and Capital Improvements Budget, 1974; Flood Hazard Analyses – Greenville, Alabama, Persimmon and Stallings Creeks and Tributaries, 1977. Current plans that were reviewed include: Butler County Emergency Operations Plan; Butler County Industry and Community Data; and the Greenville Comprehensive Plan.

With this information, the Butler County Local Emergency Planning Committee (LEPC) was able to identify and prioritize those hazards that have the most potential to impact Butler County and its municipalities. As a result of the committee discussions about the previous information and the data found in the next chapter, seven hazards were identified as Priority 1 hazards, meaning that they were the most likely to have the greatest and/or most frequent impact on Butler County and each of its municipalities. These seven Priority 1 hazards, in order of priority are severe thunderstorm / lightning / hail / winds, tornados, floods, hurricanes / tropical storms, winter storms, extreme heat and drought, and wildfires. Natural hazards that were determined not to be applicable to Butler County and its municipalities include: avalanches, coastal erosion, coastal storms, tsunamis, and volcanoes. Priority 2 hazards include: expansive soils / sinkholes; and, Priority 3 hazards include: landslides, earthquakes, and dam failures. The hazard identification and prioritization are shown in Figure 16.

Tornados were determined to be a Priority 1 hazard due to the history of past occurrences, the speed of the event, the severity of damage incurred, and the high potential for loss of life. Since 1950, tornados have caused over $1 million in property damage alone. The agricultural character of Butler County, with a majority of the agriculture being timber production and livestock and poultry production, makes wildfire a significant hazard for residents of the county. The potential impact of wildfire is increasing as residents continue to build residential structures outside the corporate limits, expanding the urban interface area. According to the Alabama Forestry Commission, Butler County experienced 451 fire events between 1995 and 2003, which combined accounted for over 2,800 acres of land burned.

Climatic conditions of Butler County make extreme heat and drought Priority 1 hazards. Again, the agricultural community is particularly at risk in terms of property and crop damage from extreme heat and related drought conditions. Also, the

high percentage of the population with low income or living in poverty and those living in unincorporated areas without access to public water are particularly at risk due to dry wells and lack of financial resources for air conditioning to ward off the impact of extreme heat and drought. Although Butler County does not suffer from extreme property damage or loss of life due to flooding, the potential of flooding events makes it a Priority 1 hazard. The impact of flooding in Butler County is due more to crop damage and the interruption of services due to impassable roads and continued road and bridge improvements. Like flooding, it is the frequency of severe storms that make them a Priority 1 hazard. Of the past storm events, between 1950 and 2003, thunderstorms, windstorms, and hail storms were the most frequent hazard event with 82 occurrences during that time period.

No other natural hazards were identified that were not included on the list of hazards outlined by the Federal Emergency Management Agency Publication 386-2, which is a state and local mitigation planning how-to guide entitled: *Understanding Your Risks – Identifying Hazards and Estimating Losses*.

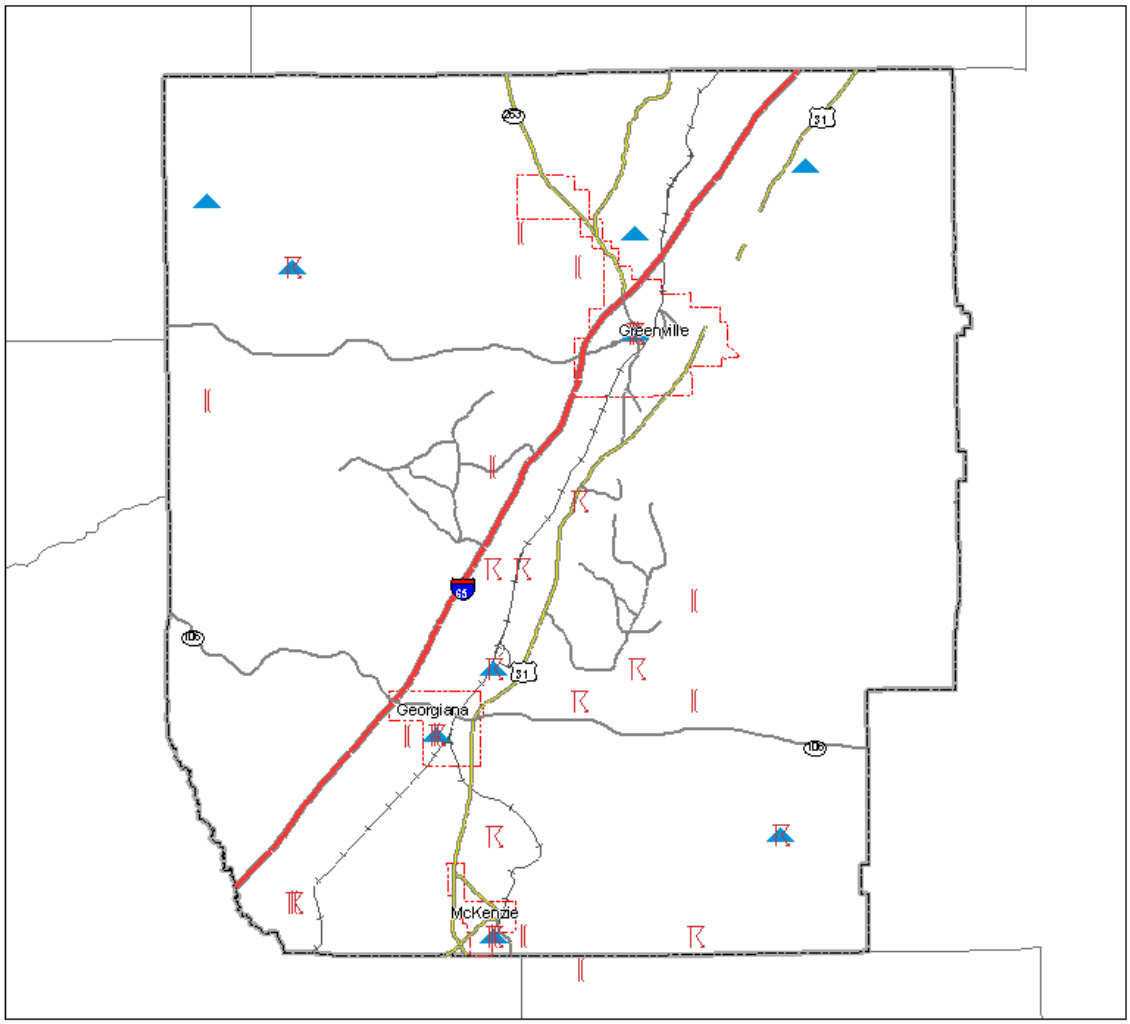
Figure 16

Hazard Identification and Prioritization for Butler County and All Municipalities

Hazard	Priority 1	Priority 2	Priority 3	Not Applicable
Avalanche				**13**
Coastal Erosion				**13**
Coastal Storm				**13**
Dam Failure			**12**	
Drought	**6**			
Earthquake			**11**	
Expansive Soils/Sinkhole		**9**		
Extreme Heat	**6**			
Flood	**3**			
Hurricane/Tropical Storm	**4**			
Landslide			**10**	
Severe Thunderstorm/Wind/Hail/Lightning	**1**			
Tornado	**2**			
Tsunami				**13**
Volcano				**13**
Wildfire	**7**			
Winter Storm	**5**			

Figure 17

Historical Storm Events*



*Note: The Storm Events depicted here are based on the geographic coordinates provided by NOAA's National Climatic Data Center (NCDC). Since the NCDC only included figures for degrees and minutes, and not seconds, the exact locations depicted are approximate. Additionally, only severe thunderstorms/winds, hailstorms, and tornados are shown since they are the only storm events with geographic coordinates provided. It can be assumed that other storm events not depicted herein (e.g., hurricanes, winter storms, etc.) occurred countywide or that the coordinates data was not available or recorded.

Sources: NOAA, National Climatic Data Center (NCDC), Storm Events, 1950-2003; Census Bureau TIGER/Line Files 2000; and local sources.

IV. RISK ASSESSMENT AND VULNERABILITY ANALYSIS

The risk assessment and vulnerability analysis is based on the following seven priority one natural hazards as identified by the Butler County LEPC and described in the previous chapter: severe thunderstorm / lightning / hail / winds, tornados, floods, hurricanes / tropical storms, winter storms, extreme heat and drought, and wildfires. The *State of Alabama Hazard Risk and Vulnerability Analysis,* prepared by the Alabama Emergency Management Agency defines ***risk*** as the probability that damage to life and property will occur due to impacts from a particular natural hazard. This can include an analysis of: the **magnitude**, or how big or strong the event may be, the **duration**, or how long the event will last, the **frequency**, or how often the event may occur, and the **area affected,** or where and how much area may be impacted by an event. The same document defines ***vulnerability*** as the degree of **exposure** to a hazard – how susceptible an area is to a hazard and the losses likely to result from a disaster.

In this chapter, each of the seven Priority 1 hazard categories will be assessed in terms of risk and vulnerability, as defined. Information provided for each category includes a definition of the hazard; the degree of risk as noted by the priority rating given to each hazard by the Butler County Local Emergency Planning Committee upon identification of the hazard; historical and financial loss data, as available; and the degree of impact (vulnerability) on Butler County and its residents, with comments regarding how the hazard might or could affect the county. The chapter is concluded with the identification of critical facilities that could be impacted by any of these hazard events.

Severe Thunderstorms / Winds / Hail /Lightning

Thunderstorms are generated by atmospheric imbalance due to the combination of unstable warm air rising rapidly into the atmosphere, sufficient moisture to form clouds and rain, and an upward lift of air currents caused by colliding waterfronts, sea breezes, or mountains. Thunderstorms can produce tornadoes and floods (both discussed in other portions of this plan), hail, high winds, and lightening.

Severe thunderstorms, wind, hail, and lightning have been a common event for Butler County and its municipalities in the past and will continue to be so in the future. Between 1950 and 2003, 82 severe thunderstorms, wind, and hail events have occurred in Butler County and its municipalities, causing an estimated $289,000 in property and crop damages. In the past, there has been a minimal loss of critical facilities. However, the loss of critical facilities as a result of severe thunderstorms, wind, hail, and lightning are rare. In addition, there have been reports of minor property damage most being a result of lightning strikes or hail. Overall the impacts of severe thunderstorms, wind, hail, and lightning on Butler County have been negligible. As a result, it was determined that future impacts will most likely continue to be negligible meaning minor injuries may occur; critical facilities may be shut down for 24 hours or less, and less than ten percent of the property in the community would be damaged. Nonetheless, due to frequency in occurrence, the Butler County LEPC has ranked severe thunderstorms, wind, hail, and lightning as the number one natural hazard that has the greatest potential to impact Butler County. The LEPC determined that the county's vulnerability to extreme heat and drought is high.

Profile of Severe Thunderstorms, Wind, Hail, & Lightning Events in Butler County & Municipalities, 1950-2003

Severe Thunderstorms, Wind, Hail, & Lightning

Date	Location	Hail (H) or Thunder-storm/Wind (T)	Magni-tude*	Loss of Life	Injuries	Financial Loss
4/7/1973	County	T		0	0	$ -
4/18/1978	County	T		0	0	$ -
4/18/1978	County	T		0	0	$ -
11/17/1978	County	T		0	0	$ -
3/30/1981	County	T		0	0	$ -
4/1/1981	County	T		0	0	$ -
3/20/1983	County	T		0	0	$ -
12/6/1983	County	T		0	0	$ -
8/1/1984	County	T		0	0	$ -
4/15/1985	County	H	0.75"	0	0	$ -
4/15/1985	County	T		0	0	$ -
8/24/1985	County	T		0	0	$ -
2/10/1986	County	T		0	0	$ -
7/25/1987	County	T		0	0	$ -
5/24/1988	County	H	1.00"	0	0	$ -
5/24/1988	County	H	0.75"	0	0	$ -
6/5/1989	County	T		0	0	$ -
9/2/1989	County	T		0	0	$ -
9/2/1989	County	T		0	0	$ -
1/25/1990	County	T		0	0	$ -

2/10/1990	County	T		0	0	$ -
2/16/1990	County	T		0	0	$ -
4/1/1990	County	T		0	0	$ -
4/28/1990	County	H	1.75"	0	0	$ -
4/28/1990	County	H	1.75"	0	0	$ -
12/3/1990	County	T		0	0	$ -
3/1/1991	County	T		0	0	$ -
4/29/1991	County	H	1.75"	0	0	$ -
4/29/1991	County	H	1.75"	0	0	$ -
4/29/1991	County	T		0	0	$ -
1/13/1992	County	T		0	0	$ -
4/20/1992	County	T		0	0	$ -
4/20/1992	County	T		0	0	$ -
5/26/1992	County	T		0	0	$ -
11/4/1992	County	T		0	0	$ -
4/15/1993	County	T		0	0	$ -
7/22/1994	Greenville	T	50	0	0	$ 50,000
4/11/1995	County	H	1.75"	0	0	$ -
4/23/1995	Georgiana	H	0.75"	0	0	
12/1/1996	Greenville	T	50	0	0	$ 1,500
12/16/1996	Georgiana	T	50	0	0	$ 1,500
1/24/1997	Georgiana	T	50	0	0	$ 3,000
3/29/1997	Greenville	H	0.75"	0	0	$ -
3/29/1997	Greenville	H	0.75"	0	0	$ -
4/22/1997	Georgiana	H	0.75"	0	0	$ -
4/22/1997	Georgiana	T	50	0	0	$ 1,500
5/28/1997	McKenzie	T	50	0	0	$ 1,500
11/21/1997	Greenville	T	50	0	0	$ 2,500
1/7/1998	Greenville	T	50	0	0	$ 3,500
3/8/1998	Greenville	H	0.75"	0	0	$ -
3/8/1998	Greenville	H	0.75"	0	0	$ -
3/8/1998	Greenville	T	50	0	0	$ 3,000
5/3/1998	McKenzie	H	1.00"	0	0	$ -
5/3/1998	McKenzie	H	2.75"	0	0	$ 10,000
5/3/1998	Greenville	T	75	0	0	$ 15,000
6/6/1998	Georgiana	T	50	0	0	$ 20,000
3/3/1999	McKenzie	T	50	0	0	$ 10,000
5/18/1999	Georgiana	H	0.75"	0	0	$ -
8/9/1999	McKenzie	T	50	0	0	$ 2,000
2/13/2000	Greenville	H	0.75"	0	0	$ -
2/13/2000	Greenville	T	50	0	0	$ 5,000
3/19/2000	Greenville	T	60	0	0	$ 10,000
7/20/2000	Greenville	T	55	0	0	$ 5,000
8/27/2000	Georgiana	H	0.75"	0	0	$ -
1/19/2001	County (Forest Home)	T	55	0	0	$ 5,000
3/12/2001	County (Oaky Streak)	T	65	0	0	$ 50,000
3/12/2001	County (Forest	T	50	0	0	$ 10,000

	Home)					
6/14/2001	Greenville	T	55	0	0	$ 5,000
10/13/2001	Greenville	T	60	0	0	$ 20,000
10/13/2001	Greenville	T	50	0	0	$ 10,000
11/24/2001	Georgiana	H	1.00"	0	0	$ -
10/29/2002	McKenzie	T	50	0	0	$ 5,000
12/24/2002	County (Garland)	T	50	0	0	$ 5,000
3/13/2003	County	H	1.75"	0	0	$ 1,000
4/25/2003	County (Forest Home)	H	0.75"	0	0	$ -
4/25/2003	Georgiana	H	0.75"	0	0	$ -
5/2/2003	County (Forest Home)	H	0.75"	0	0	$ -
5/2/2003	County (Oaky Streak)	H	0.75"	0	0	$ -
5/2/2003	County (Monterey)	H	0.75"	0	0	$ -
5/2/2003	Greenville	T	50	0	0	$ 25,000
5/3/2003	Georgiana	H	0.75"	0	0	$ -
8/6/2003	Greenville	T	50	0	0	$ 8,000
TOTAL	**82 events**			**0**	**0**	**$289,000**
JURISDICTIONAL SUMMARY						
Georgiana	11 events			0	0	$ 26,000
Greenville	19 events			0	0	$ 163,500
McKenzie	6 events			0	0	$ 28,500
Unincorporated Areas	46 events			0	0	$ 71,000
Note: *Magnitude for hail events is depicted as the average diameter of hail stones. Magnitude for thunderstorm and wind events is expressed in knots.						
Source: Storm Events 1950-2003, National Climatic Data Center (NCDC), National Oceanographic and Atmospheric Administration (NOAA), 2004.						

Tornados

As defined by the Federal Emergency Management Agency, a tornado is a violently rotating column of air extending from a thunderstorm to the ground. The most violent of tornadoes are capable of tremendous destruction with wind speeds of 250 miles per hour or more. Damage paths can be in excess of one mile wide and 50 miles long. Tornados are the number two hazard risk for Butler County, not due to the frequency of events, but instead, due to the severity of destruction and the limited warning time for response. Butler County is located in Wind Zone III, which is associated with 200 miles per hour wind speeds. Tornado paths are not localized and have the potential to affect any portion of the entire county during a given event.

Profile of Tornado Events in Butler County & Municipalities, 1882 to 2003					
Tornado					
Date	**Location**	**Magnitude**	**Loss of Life**	**Injuries**	**Financial Loss**
3/27/1882	County	F3	2	20	Unknown
12/23/1900	County	F2	0	3	Unknown
4/15/1910	County	F2	1	20	Unknown
2/27/1913	Greenville	F2	3	4	Unknown
4/30/1924	Greenville	F3	1	10	Unknown
1/30/1947	County	F3	3	30	Unknown
6/28/1957	County	F2	0	0	$250,000
6/28/1957	County	F2	0	0	$250,000
7/4/1960	County	F0	0	0	$0
7/4/1960	County	F0	0	0	$0
10/4/1964	County	F1	0	0	$25,000
12/24/1964	County	F2	0	0	$25,000
12/26/1964	County	F1	0	0	$25,000
4/18/1969	County	F4	2	11	$250,000
6/17/1973	County	F1	0	0	$0
11/25/1979	County	F2	0	0	$25,000
3/20/1983	County	F1	0	0	$0
7/17/1995	County (Foster Flats)	F0	0	0	$1,000
10/4/1995	Georgiana	F0	0	0	$10,000
10/25/1997	County	F0	0	0	$4,000
11/24/2001	Georgiana	F0	0	0	$30,000
11/24/2001	McKenzie	F1	0	3	$100,000
11/24/2001	County (Garland)	F0	0	0	$8,000
11/5/2002	Georgiana	F0	0	0	$0
Total	**24 events**		**12**	**101**	**$1,013,000**
JURISDICTIONAL SUMMARY					
Georgiana	3 events		0	0	$40,000
Greenville	2 events		4	14	Unknown
McKenzie	1 event		0	3	$100,000
Unincorporated Areas	18 events		8	84	$873,000
Sources: Storm Events 1950-2003, NCDC, NOAA, 2004; and Alabama Tornado Database, National Weather Service (NWS), NOAA, 2003.					

With the available information as presented, the Butler County LEPC determined that Butler County is moderately to severely vulnerable to tornados. Potential impacts from tornados include loss of life and injury; severe property damage with frame, manufactured, and congregate housing being the most susceptible; water contamination and water shortage; blocked access and road deterioration; power outages, disruption of commerce. Butler County's vulnerability can be increased due to a lack of available trained response personnel, slowed emergency response time, and an overload at existing medical facilities. Resulting secondary impacts

of a tornado could include panic, anxiety, and depression; power outages; interruption in utility services (e.g., communications and water); loss of tax revenue and economic opportunities; spoilage of goods; decreased employer production; and loss of timber income.

Flooding

As defined by the Federal Emergency Management Agency, a flood is a natural event for rivers and streams. Excess water from snowmelt, rainfall, or storm surge accumulates and overflows onto the banks and adjacent floodplains. Floodplains are lowlands, adjacent to rivers, lakes and oceans that are subject to recurring floods. Flooding is one of the most common hazards in the United States and kills an average of 150 people a year nationwide. While Butler County is not highly susceptible to severe inundation of flood waters, it is highly susceptible to the rapid occurrence of flash floods that make parts of the county inaccessible by road and interrupt the delivery of services and the ability to respond in an emergency. Flooding is number three in the list of natural hazards that have the greatest potential to impact Butler County.

Profile of Flooding Events in Butler County & Municipalities, 1950 to 2003

Flooding					
Date	**Location**	**Type**	**Loss of Life**	**Injuries**	**Financial Loss**
5/28/1997	County (Garland)	Flash Flood	0	0	$1,500
3/8/1998	Countywide	Heavy Rain	0	0	$800,000
9/28/1998	Countywide	Heavy Rain	0	0	$0
6/27/1999	County (southern parts)	Flash Flood	0	0	$3,000
3/3/2001	Countywide	Flash Flood	0	0	$10,000
11/24/2001	Greenville	Flash Flood	0	0	$10,000
Total	**6 events**		**0**	**0**	**$824,500**
JURISDICTIONAL SUMMARY					
Georgiana	0 events		0	0	$0
Greenville	1 event		0	0	$10,000
McKenzie	0 events		0	0	$0
Unincorporated Areas	5 events		0	0	$814,500
Sources: Storm Events 1950-2003, NCDC, NOAA, 2004.					

With the available information, the Butler County LEPC determined that, while the flooding problem is recurring, the impact of flooding on Butler County is low.

Potential impacts from flooding are surface and groundwater contamination, increased septic failure, increased stress and anxiety, increased road damage, threat to the rail system, increased agricultural loss for both crops and livestock, and loss of natural habitat. While there is a low threat to life safety and structural conditions, the repetitive losses and damages to the road system make flooding a significant hazard to Butler County.

Tropical Cyclones (Hurricanes & Tropical Storms)

As defined by the Federal Emergency Management Agency, a tropical cyclone is a generic term for a cyclonic, low-pressure system over tropical or subtropical waters. Hurricanes are intense tropical systems that generate winds in excess of 74 mph. These storms are generally characterized by thunderstorms and defined surface wind circulation. They can produce high winds, heavy rains, erosion, flooding, and spawn tornados. Extratropical storms generate similar effects but tend to occur in the fall or winter. Because tropical and extratropical cyclones are large, moving storm systems, they can impact not only coastal areas, but inland areas as well. Hurricane Opal (1995), which traversed Butler County, is an excellent example of a tropical system having such a large impact inland. While Butler County is not necessarily susceptible to the full effects of a tropical cyclone making landfall along the coast, it is highly susceptible to the other events that occur or spawn off of the cyclonic system. Floods caused by the storm's rain can make parts of the county inaccessible by road and interrupt the delivery of services and the ability to respond in an emergency. Tornados spawned off of a hurricane can cause loss of life, injuries, and cause damage to buildings and infrastructure. Tropical cyclones are number four in the list of natural hazards that have the greatest potential to impact Butler County.

Profile of Tropical, Subtropical, & Extratropical Cyclone Events in Butler County & Municipalities, 1893 to 2003**					
Cyclones					
Date	**Name**	**Category**	**Loss of Life**	**Injuries**	**Financial Loss**
10/3/1893	Not Named	H1	Unk.	Unk.	Unknown
10/11/1902	Not Named	E	Unk.	Unk.	Unknown
11/3/1904	Not Named	TS	Unk.	Unk.	Unknown
10/6/1934	Not Named	TS	Unk.	Unk.	Unknown
10/8/1959	Irene	TD	Unk.	Unk.	Unknown
10/3/1995	Opal	H1	0	0	$52,000,000*
9/25/1998	Georges	TD	1	0	$179,500,000*
6/12/2001	Allison	SD	Unk.	Unk.	Unknown
8/6/2001	Barry	TS	0	0	$200,000*
Total	**9 events**		**1**	**0**	**$231,700,000***
*Notes: *Figures are from NCDC data and are statewide; figures not immediately available for Butler County. **With the exception of Opal, Georges, and Barry, the rest of the listed cyclones were those that directly traversed Butler County.*					
Sources: Historical North Atlantic Tropical Cyclone Tracks, National Hurricane Center, NOAA, 2002; Storm Events 1950-2003, NCDC, NOAA, 2004.					

Winter Storms

Winter storms can affect agriculture, transportation, utilities, businesses, and schools, and can pose great danger to the public. While the region and Butler County are generally unaccustomed to snow, ice, and extreme freezing temperatures, they do occur and can cause severe consequences. Wet snow and ice can accumulate on trees, utility lines, and power/utility poles and towers causing them to snap under the extra weight. Motorists in this region are typically unfamiliar with driving on slick and iced over roads and bridges, and traffic accidents increase. Additionally, some buildings may not be adequately insulated or lack heat altogether, creating danger to the occupants. Crops can also be affected and a year's or season's entire yield could be damaged or lost. Since these occurrences are rare, local municipalities generally do not posses snow or ice removal and treatment equipment to help minimize accidents. Taking these factors into consideration, winter storms are ranked fifth in the list of natural hazards that have the greatest potential to impact Butler County.

Profile of Winter Storm Events in Butler County & Municipalities, 1950 to 2003				
Winter Storms				
Date	**Location**	**Loss of Life**	**Injuries**	**Financial Loss**
1/2/2002	Countywide	0	0	$0
Total	**1 event**	**0**	**0**	**$0**
Source: Storm Events 1950-2003, NCDC, NOAA, 2004.				

Extreme Heat and Drought

Extreme heat and drought often occur simultaneously in Butler County. Drought is a prolonged period of dry weather due to a lack of rain. The National Oceanic and Atmospheric Administration reports that the annual normal daily mean temperature for Montgomery, which is the closest station to Butler County, between 1971 and 2000 is 65.1 degrees Fahrenheit, with the warmest month being July at 81.8 degrees Fahrenheit and the coldest month being January at 46.6 degrees Fahrenheit. The annual normal monthly precipitation during the same time period is 54.77 inches with an average of 108 days per year with precipitation of more than .01 inch. Butler County's economic dependence upon agriculture, coupled with the low per capita income of the county, at $15,715 according to the 2000 Census, makes the county population very susceptible to extreme changes in weather. Conditions of extreme heat and drought affect the population's ability to produce livable earnings and produce dangerous living conditions for the low-income sector of the population due to an inability to find refuge from extreme heat.

The Butler County LEPC determined that the county's vulnerability to extreme heat and drought is moderate with the most severe threat being to county's elderly and low-income population. Extreme heat and drought also places an increased demand on medical services and emergency response services that are already in short supply. Additional impacts on the county due to extreme heat and drought include increased road cracking and road repairs resulting in higher maintenance costs and inaccessibility to some portions of the county; increased power and water usage resulting in higher payments and sometimes higher rates; increased fire potential; increased loss of vegetation and property damage with the most significant threat to agricultural production including crops, timber and livestock; an increased threat to the quantity and quality of water supplies; and increased anxiety in the population which can result in increased crime.

Profile of Major Storm Events in Butler County & Municipalities, 1950-2003

All Storm Events*

Location**	Type							Loss of Life	Injuries	Financial Loss***
	Th.	H	Tor.	F	Hur.	WS	EH			
Butler County (Countywide)				4	3	1	1	1	0	$ 232,213,000
Butler County (Unincorporated Communities)	4	4	2	1				0	0	$ 82,500
Butler County (Unknown)	29	9	16	0				8	84	$ 855,000
Town of Georgiana	4	7	3	0				0	0	$ 74,000
City of Greenville	14	5	2	1				4	14	$ 173,500
Town of McKenzie	4	2	1	0				0	3	$ 128,500
TOTALS	**55**	**27**	**24**	**6**	**3**	**1**	**1**	**13**	**101**	**$233,526,500**

Key: Th. = Severe Thunderstorms/Winds; H = Hail; Tor. = Tornados; F = Flooding; Hur. = Hurricanes/Tropical Storms; WS = Winter Storm; EH = Extreme Heat

*Notes: *Does not include wildfires. **Countywide events are not counted under the municipalities. ***Hurricane/Tropical Storm Figures are from NCDC data and are statewide; figures not immediately available for Butler County.*

Sources: Storm Events 1950-2003, NCDC, NOAA, 2004; and Alabama Tornado Database, NWS, NOAA, 2003.

Wildfire

As defined by the Federal Emergency Management Agency, a wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. Wildfires often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires. Wildfires are the number two hazard in Butler County due, in large part, to the presence forested land in the county. Of the total land in Butler County, 79 percent is in forested land – totaling almost 394,000 acres of forest land. Due to an expanding urban interface area, the threat of human danger from wildfires is steadily increasing in Butler County. Beyond loss of life, injury and property damage issues that arise from wildfires, Butler County's dependence upon the timber industry means that the overall economic well being of the county is threatened by wildfires as well. The fact that the average annual value of stumpage timber sold in Butler County is over $28 million illustrates the point.

Profile of Wildfire Events in Butler County, 1995 to 2003			
Wildfires			
Fiscal Year	**Number**	**Burned Acres**	**Avg. Size (Acres)**
1995	38	139.6	3.7
1996	44	320.9	7.3
1997	35	189.0	5.4
1998	36	124.2	3.5
1999	27	116.5	4.3
2000	103	662.4	6.4
2001	54	384.9	7.1
2002	71	843.3	12.1
2003	43	93.9	2.2
Total	**451 events**	**2,874.7**	**6.4**
Source: Alabama Forestry Commission, 2004.			

With the available information as presented, the Butler County LEPC determined that, while the risk is high, Butler County is moderately vulnerable to wildfires. Potential impacts from wildfires include loss of life and injury; severe property damage; injury to victims and response personnel; smoke inhalation and toxic fumes; decreased visibility for vehicular traffic leading to a documented increase in auto accidents; threats to utility lines and poles, phone boxes and fiber optic lines. Additionally, there is a high incidence of repetitive losses due to wildfires in Butler County.

Secondary impacts from wildfires include a loss of tax revenue due to a loss of timber; erosion which leads to road and bridge deterioration; loss of habitat and a threat to endangered species; threatened water quality and stream sedimentation. The risks and vulnerability associated with wildfire are only increasing with continued urban sprawl.

Probability

The probability (%) that an identified hazard of Priority 1 status will occur on an annual basis was determined using the following formula:

Number of historical or reported events in that time period / Number of years incidents occurred within = Probability of A Future Annual Event

A similar formula was used to determine an estimate of the expected damages from each event:

Total amount of damages (in dollars) for each historical or reported event / Number of damage causing events within the time period = Damage Expectations Per Damaging Event

Priority 1 Event Probability for Butler County & Municipalities			
Natural Hazard Events	**Number of Historical Events**	**Probability of A Future Annual Event**	**Damage Expectations Per Damaging Event (in $)***
County & Municipalities			
Severe Thunderstorm/Wind/Lightning (1950-2003; 53)	55	>100%	11,120.00
Hail (1950-2003; 53)	27	>100%	5,500.00
Tornado (1882-2003; 121)	24	51%	72,358.00
Flooding (1950-2003; 53)	6	11%	164,500.00
Hurricane/Tropical Storm (1893-2003; 110)**	9	8%	77,133,333
Winter Storm (1950-2003; 53)**	1	2%	Unknown
Extreme Heat/Drought (1950-2003; 53)**	1	2%	Unknown
Wildfires (1995-2003; 8)**	451	56%	Not available
Georgiana			
Severe Thunderstorm/Wind/Lightning (1950-2003; 53)	4	8%	6,500.00
Hail (1950-2003; 53)	7	13%	0.00
Tornado (1882-2003; 121)	3	3%	16,000.00
Greenville			
Severe Thunderstorm/Wind/Lightning (1950-2003; 53)	14	26%	11,679.00
Hail (1950-2003; 53)	5	9%	0.00
Tornado (1882-2003; 121)	2	2%	Unknown
Flooding (1950-2003; 53)	1	2%	10,000.00
McKenzie			
Severe Thunderstorm/Wind/Lightning (1950-2003; 53)	4	8%	7,125.00
Hail (1950-2003; 53)	2	4%	10,000.00
Tornado (1882-2003; 121)	1	1%	100,000.00
Unincorporated Areas			
Severe Thunderstorm/Wind/Lightning	33	62%	17,500.00

(1950-2003; 53)			
Hail (1950-2003; 53)	13	25%	1,000.00
Tornado (1882-2003; 121)	18	15%	86,500.00
Flooding (1950-2003; 53)	5	9%	203,625.00
*Notes: *Some historical damage figures for certain types of events were unknown, not recorded, or not immediately available (esp. wildfires). **These events occurred on a countywide basis and therefore not factored into the separate listings for each municipality.*			
Sources: Storm Events 1950-2003, NCDC, NOAA, 2004; Alabama Tornado Database, NWS, NOAA, 2003; Historical North Atlantic Tropical Cyclone Tracks, National Hurricane Center, NOAA, 2002; and Alabama Forestry Commission, 2004.			

Structural Assets and Impacts

An inventory of assets and critical facilities susceptible to the identified Priority 1 hazards within Butler County has been attempted. At the time of this plan's submission to AEMA and FEMA, a complete inventory has not been completed. Values for the different types of buildings (i.e., residential, commercial, industrial, agricultural, institutional, governmental/educational, and utilities) in Butler County has not been performed. The Butler County EMA and LEPC intend to have this information collected and analyzed by the next five-year major update. Such an analysis should describe the vulnerability of the types and numbers of existing and potential future buildings, infrastructure, and critical facilities located in specific hazard areas. Building values should be obtained from the Butler County Tax Assessor's Office and/or from each jurisdiction's property insurance providers. Of the Priority 1 hazards, only flooding poses a localized risk to buildings and structures in certain areas – primarily in the built areas lying in or along the identified floodplains. Otherwise, all buildings and structures within Butler County are vulnerable to all natural hazards identified as being Priority 1.

Impacts on Population

As stated in the section above, the entire area of Butler County is vulnerable to all identified Priority 1 natural hazards with the exception of flooding. Population figures and number of households vulnerable to the identified Priority 1 hazards are as follows:

Population Vulnerable to Hazards		
Priority 1 Hazard	**Population**	**Households**
County & Municipalities		
Severe Thunderstorm/Wind/Hail Lightning	21,399	8,398
Tornado	21,399	8,398
Flooding	8,028*	3,080*
Hurricane/Tropical Storm	21,399	8,398
Winter Storm	21,399	8,398
Extreme Heat/Drought	21,399	8,398
Wildfire	21,399	8,398
Georgiana		
Severe Thunderstorm/Wind/Hail Lightning	1,737	697
Tornado	1,737	697
Flooding	1,337*	530*
Hurricane/Tropical Storm	1,737	697
Winter Storm	1,737	697
Extreme Heat/Drought	1,737	697
Wildfire	1,737	697
Greenville		
Severe Thunderstorm/Wind/Hail Lightning	7,228	2,919
Tornado	7,228	2,919
Flooding	378*	134*
Hurricane/Tropical Storm	7,228	2,919
Winter Storm	7,228	2,919
Extreme Heat/Drought	7,228	2,919
Wildfire	7,228	2,919
McKenzie		
Severe Thunderstorm/Wind/Hail Lightning	644	284
Tornado	644	284
Flooding	0*	0*
Hurricane/Tropical Storm	644	284
Winter Storm	644	284
Extreme Heat/Drought	644	284
Wildfire	644	284
Unincorporated Areas		
Severe Thunderstorm/Wind/Hail Lightning	11,790	10,336
Tornado	11,790	10,336
Flooding	6,313*	2,416*
Hurricane/Tropical Storm	11,790	10,336
Winter Storm	11,790	10,336
Extreme Heat/Drought	11,790	10,336
Wildfire	11,790	10,336
*Notes: *These values are estimates based on aggregate land areas (i.e., Census blocks) falling into vulnerable regions (i.e., floodplains) assuming even population distribution across the enumeration units. Due to such, figures for all areas may be inflated.*		
Source: U.S. Census Bureau, Census 2000.		

Critical Facilities

The process of determining Butler County's risk and vulnerability to natural hazards enabled the Butler County LEPC to identify critical facilities that would be impacted in the event of a disaster event. The LEPC identified critical facilities located in Butler County, based on two types of criteria: (1) Buildings or locations vital to the response and recovery effort, such as police and fire stations and telephone exchanges; and (2) Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes. The critical facilities were grouped into one of seven categories as shown in the list on the following page.

As of the submission of this plan, a complete inventory of critical facilities susceptible to the identified Priority 1 hazards within Butler County has been attempted, but not completed. Exact locations and facility values are still being researched and assessed. With the exception of flooding, all of the critical facilities are vulnerable to all of the identified Priority 1 natural hazards. The appropriate utility companies and departments, and the local governments, have been asked for this information, and several are still researching this information. The Butler County EMA and LEPC intend to have this information collected and analyzed by the next five-year major update.

Butler County Critical Facilities	
Continuity of Government	**Water, Sewer, and Solid Waste Utilities**
Butler County Courthouse Butler County Courthouse Annex Georgiana Town Hall Greenville City Hall McKenzie Town Hall	Butler County Water Authority Georgiana Water Works & Sewer Board Greenville Water Works & Sewer Board McKenzie Water Board BFI Waste Services of Greenville
Law Enforcement	**Hospitals/Health Care Agencies**
Butler County Sheriff's Office Georgiana Police Department Greenville Police Department Butler County Jail	L. V. Stabler Memorial Hospital (Greenville) Family Rural Medical Clinic (Georgiana) Georgiana Hospital Butler County Health Dept. (Greenville) Greenville Pediatrics Tri County Medical Center (McKenzie) Tri County Medical Center (Georgiana) Butler Day Treatment (Greenville) Biomedical Applications Camellia (Greenville) Dialysis Clinic, Inc. (Georgiana) Reliable Home Health (Georgiana) Comfort Care Hospice of Greenville Crowne Health Care of Greenville Georgiana Nursing Facility Homewood Greenville Pine Needle Place, Inc. (Greenville) South Central Alabama Mental Health Board (Greenville)
Disaster Coordination and Support Agencies / Social Services	**Electric Power & Gas Utilities**
Butler Co. Emergency Mgmt Agency Butler Co. Dept. of Human Resources Organized Community Action Program (OCAP)	Alabama Power Company Pioneer Electric Cooperative Alabama Electric Cooperative ACME Propane Gas AmeriGas Dowdle Gas Co. Southeast Alabama Gas District

Water Sources	Telephone, Cable, & Communications
Aquifers: Eutaw, Ripley, and Nanafalia Formations	BellSouth CenturyTel Bright House Networks Camellia Communications *Greenville Advocate* WKXN WGYV WQZX
Fire Protection	**Schools**
Bolling, Sandcut, & Wald VFD Brushey/Mashey Creek VFD Central VFD F.I.W. VFD Forest Home VFD Garland VFD Georgiana VFD Greenville Fire Department Liberty VFD McKenzie VFD Midway-Damascus VFD P&MP VFD Pigeon Creek VFD Searcy VFD Shackleville VFD Spring Creek VFD Starlington VFD	LBW Community College – Greenville Campus Greenville Elementary School W.O. Parmer Elementary School Greenville Middle School Greenville High School McKenzie High School R.L. Austin Elementary School Georgiana High School Georgiana Head Start Center Greenville Head Start Center Camellia City Christian Academy Fort Dale Academy
Mass Care Shelters	**Building & Farm Supplies**
All Public Schools Beeland Park YMCA County Fairgrounds Greenville Post Office	Country Farms Supply The Feed Store Greenville Cash & Carry/True Value Greenville Hardware Co. L&S Farm Services Lees Hardware Co. Lowery Hardware Quality Co-Operative Inc. S&M Hardware Shep Pierce Timber Co.
Adult & Child Daycare	**Other**
Greenwood Church Daycare Jack & Jill Day Care Learning Bee South Central Alabama Childcare Mgmt. Agency, Inc. Wonderland Day Care Center, Inc. Fellowship Adult Day Care Georgiana Nutrition Center	None at this time
Source: Butler County LEPC, 2004.	

Estimated Losses

The below table depicts general estimates of property damage that could result from each of the identified Priority 1 hazards based on historical data per event average in Butler County and all four municipalities. Theses are gross estimates of yearly damages and should only be interpreted as indicators of the degree of damage possible. The figures are based solely on past occurrences, as described in other parts of this plan. More accurate methods are available to assess damages, particularly the U.S. Army Corps of Engineers' Flood Damage Assessment (HEC-FDA) model, FEMA's Benefit-Cost Modules, and the HAZUS loss estimation software. The Butler County EMA and LEPC intend to conduct more detailed loss estimates by applying the latest version of HAZUS-MH for multi-hazard assessments, and have this information analyzed by the next five-year major update.

Estimated Loss Projections Resulting From Priority 1 Hazards

Hazard	Average Occurrences (per year)	Total Deaths	Total Injuries	Average Crop and Property Loss (per event/per year)	Maximum Historical Property Loss (per event)
Severe Thunderstorm/Wind/Lightning	1.04	0	0	$5,055 / $5,245	$50,000
Hail	0.51	0	0	$407 / $208	$10,000
Tornado	0.20	12	101	$42,208 / $19,113	$250,000
Flooding	0.11	0	0	$137,417 / $15,557	$800,000
Hurricane/Tropical Storm	0.08	1	0	*	*
Winter Storm	0.02	0	0	$0 / $0	$0
Extreme Heat/Drought	0.02	0	0	$0 / $0	$0
Wildfires	56.38	**	**	**	**

*Notes: *The potential for damages from hurricanes and other major cyclonic events does exist within Butler County. However, county specific damage estimates were not available. **The potential for wildfire damages within Butler County do exist. The figures for wildfire damages under these columns were not available at this time, however.*

Sources: Storm Events 1950-2003, NCDC, NOAA, 2004; Alabama Tornado Database, NWS, NOAA, 2003; Historical North Atlantic Tropical Cyclone Tracks, National Hurricane Center, NOAA, 2002; and Alabama Forestry Commission, 2004.

Development Patterns

Butler County is centrally located in the State and is largely rural, with the primary land uses being farming and forestry. Greenville, the largest municipality, is located in the northern half of the county, along Interstate 65. Other land uses in the county consist of: industrial areas, located primarily in Greenville; commercial located in each of the three municipalities, in downtown areas and along major roads; residential areas, mostly located throughout the three municipalities, and in very small pockets throughout the county; farmland, which is located throughout the

county, but usually near streams and lower elevations; forests, located throughout the county, but especially in the southern two-thirds of the county; and various specialized lands uses (institutional, mixed, etc.) located in the three municipalities, but especially Greenville. Land uses within the municipalities are generally in conformance with current zoning and land use regulations, and are expected to remain in the current use for the foreseeable future.

Greenville is recently undergoing industrial development as several Hyundai automobile suppliers are constructing plants in the City over the past several years. A potential increase in residential and commercial development is expected to follow as employees to these plants and any "spin-off" businesses locate to the area. Based on the most recent land use plan for the city, Greenville appears to have enough room within its boundaries to expand and develop the aforementioned and other uses. The zoning for the currently undeveloped areas will permit any growth to occur in the near future, with no major zoning changes.

The remainder of the county is not expected to undergo significant development pressure and there are not any anticipated changes in land use for the near future.

V. HAZARD MITIGATION STRATEGY

The Hazard Mitigation Strategy outlines methods, or action steps, for implementation of the Butler County Natural Hazard Mitigation Plan over a five year time period. The strategy includes goals and objectives that were developed to guide the development of the plan and the subsequent mitigation efforts. The goals and objectives are followed by specific mitigation action steps to be implemented. The list of action steps includes an estimated cost per item and designates who the responsible agency or agencies should be. The final portion of the mitigation strategy is a five-year time schedule and cost breakdown per year for implementation. With input by from the governments and non-governmental organizations represented on the LEPC, and from public input received at the public meetings, the following goals and objectives were established by the LEPC to guide hazard mitigation efforts on an on-going basis beyond the five-year time frame of the implementation strategy. These goals and objectives were established for the County and all of its municipalities.

Goal A: Promote natural hazard mitigation as a means to decrease loss of life, property damage and economic loss during a disaster occurrence.

Objective A-1: Establish a full warning system for notification of impending disasters throughout Butler County.

Objective A-2: Ensure that adequate protection shelters are available for use during disaster occurrences.

Objective A-3: Develop and adopt, or amend, and enforce land use regulations and ordinances and modern building codes that support natural hazard mitigation efforts throughout Butler County.

Objective A-4: Implement fire protection measures to decrease potential for loss of life and property damage.

Objective A-5: Limit impact of heat and drought on human health, property damage, and agricultural losses.

Objective A-6: Improve infrastructural facilities and remove at-risk commercial and residential buildings to limit the impact of natural hazard events.

Objective A-7: Investigate, prepare, and provide for mitigation and emergency services and activities before, during, and after a disaster event.

Goal B: Provide on-going support of the Butler County Emergency Management efforts to make Butler County less vulnerable to natural disasters.

Objective B-1: Ensure that the Butler County Hazard Mitigation Plan remains current and is implemented.

Objective B-2: Improve coordination and communication between emergency response organizations and highly vulnerable entities.

Objective B-3: Enhance the County's and municipalities' capability to conduct further hazard risk assessments, better demonstrate funding needs, and track mitigation activities throughout the County.

Goal C: Educate general population about natural hazards and hazard mitigation options.

Objective C-1: Establish and implement hazard mitigation public awareness programs.

Objective C-2: Establish and promote disaster prevention education programs, utilizing all forms of media (e.g., print, TV, internet websites - government and related non-governmental) to help distribute information and materials.

Butler County Hazard Mitigation Action Steps

Goal A: Promote natural hazard mitigation as a means to decrease loss of life, property damage and economic loss during a disaster occurrence.

Objective A-1: Establish a full warning system for notification of impending disasters throughout Butler County.	**Estimated Cost Over 5 Years**	**Funding Source** / **Responsible Agency**
a. Develop a warning plan to install approximately 39 sirens at targeted sites to adequately cover population pockets in Butler County.	$585,000.00	Federal, State & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA
b. Designate a central emergency coordinator in each municipality and community to better facilitate communications with the Butler County Emergency Management Agency.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: County Unincorporated Communities (based on VFDs) and All Municipalities		All Municipalities
c. Construct warning signage for limited visibility due to forest fires on major roads in targeted areas.	$20,000.00	Federal, State & County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County Road Dept.
d. Investigate use of phone messaging system to provide warning of all impending hazardous conditions.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA
Total	**$605,000.00**	

Objective A-2: Ensure that adequate protection shelters are available for use during disaster occurrences.	**Estimated Cost Over 5 Years**	**Funding Source** **Responsible Agency**
a. Maintain and expand existing shelter facilities to provide adequate pre-disaster care and space, as needed.	$3,000.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County, All Municipalities & Shelter Operators
b. Designate and upgrade/retrofit, as necessary, existing public facilities to provide shelter in areas of Butler County where there currently are no shelters, primarily targeting schools and community centers, at a rate of one site every two years.	$37,500.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County, All Municipalities & Shelter Operators
c. Investigate construction of new public shelter facilities in those areas of the county with no shelter facilities as long-term and low-priority task.	$0.00	County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA
d. Secure funds to continue efforts to assist citizens in constructing private shelters on their land at a rate of seven shelters per year. (Approx. $5,000 per shelter)	$175,000.00	Federal & Private
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA
e. Work with developers, homebuilders and contractors to promote construction of a safe room in all new residential development.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA, & County & All Municipal Building/Planning Officials
f. Publicize information on locations of existing public shelters and when to use them.	$2,500.00	County, Municipal, Red Cross & DHR

Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County, All Municipalities, Butler Co. EMA, Red Cross & DHR
Total	**$218,000.00**	

Objective A-3: Develop and adopt, or amend, and enforce land use regulations and ordinances and modern building codes that support natural hazard mitigation efforts throughout Butler County.	**Estimated Cost Over 5 Years**	**Funding Source** / **Responsible Agency**
a. Incorporate and enforce flood management provisions in all county and municipal land use and zoning ordinances and regulations.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County & All Municipal Building/Planning Officials
b. Ensure that future land use and growth plans do not extend into flood plain areas.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County & All Municipal Building/Planning Officials
c. Develop long-range growth and development plan for Butler County to address permitting and construction process in unincorporated areas.	$40,000.00	Federal, State & County
Geographic Beneficiaries & Jurisdictions: County Unincorporated Communities		County Engineer/Planning Official
d. Adopt and enforce modern building codes (e.g., the 2003 International Building Code or the NFPA 5000) at the county and municipal levels.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County & All Municipal Building/Planning Officials

e. Ensure that the Butler County Emergency Management Agency is involved in the review of all local future growth and development plans.	$12,500.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County & All Municipal Building/Planning Officials
f. Identify and obtain properties in floodplains to be used for greenways, open spaces, parks, trails, and other recreational activities.	$25,000.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County & All Municipal Recreation & Planning Officials
Total	**$77,500.00**	

Objective A-4: Implement fire protection measures to decrease potential for loss of life and property damage.	**Estimated Cost Over 5 Years**	**Funding Source** **Responsible Agency**
a. Develop and utilize zoning ordinances to manage development in urban fringe areas.	$0.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: All Municipalities		County & All Municipal Building/Planning Officials
b. Establish education program to provide information on methods to construct buffers and fire breaks on private property in wildland interface areas.	$0.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA, & All County & Municipal Fire Protection Authorities
c. Support Alabama Forestry Commission efforts to help educate private landowners to protect their own and other's property through construction of fire lanes and fire breaks on forested property, making landowners aware of both their responsibility and liability.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA, & County & All Municipal Fire Protection Authorities, & County & All Municipal Building/Planning Officials
Total	**$0.00**	

Objective A-5: Limit impact of heat and drought on human health, property damage and agricultural losses	Estimated Cost Over 5 Years	Funding Source Responsible Agency
a. Work with the County and municipalities to implement public awareness and education efforts about water conservation and water quality.	$0.00	County, Municipal & Water Suppliers
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA & Water Suppliers
b. Work with Butler County medical providers to develop emergency supplies and education program.	$0.00	County, Municipal & Medical Providers
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA, County Health Dept. & Medical Providers
c. Work with Butler County Farm Service Agency and County Extension Service to establish a drought information center.	$0.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County
d. Develop a drought and heat indicator plan and warning system that includes a response strategy.	$0.00	State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA, Butler County Farm Service Agency & County Extension Service
e. Develop print public service announcements.	$2,500.00	State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA, Butler County Farm Service Agency & County Extension Service
Total	**$2,500.00**	

Objective A-6: Improve infrastructural facilities and remove at-risk commercial and residential buildings to limit the impact of natural hazard events.	**Estimated Cost Over 5 Years**	**Funding Source** / **Responsible Agency**
a. Identify roads that require elevation and paving, and that have a high potential for flooding and/or washing during flood events, to provide access and limit erosion and sedimentation.	$0.00	State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		State, County & All Municipal Road Depts.
b. Continue bridge inspection and improvement efforts to prevent washing and/or failure during flood events.	$7,000,000.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		State, County & All Municipal Road Depts.
c. Maintain all county roads to allow constant access for emergency response, recovery and repair, and continuity of delivery services at eight roads per year.	$5,000,000.00	Federal, State & County
Geographic Beneficiaries & Jurisdictions: County Unincorporated Communities		State & County Road Depts.
d. Utilize AEMA Flood Relocation Program and other appropriate FEMA and/or AEMA programs to remove at-risk commercial and residential structures from flood prone and other natural hazard areas, if necessary in the future.	$500,000.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA, & County & All Municipal Engineers
Total	**$12,500,000.00**	

Objective A-7: Investigate, prepare, and provide for mitigation and emergency services and activities before, during, and after a disaster event.	**Estimated Cost Over 5 Years**	**Funding Source** / **Responsible Agency**
a. Investigate need for emergency water supply during disaster events.	$0.00	State, County, Municipal & Water Suppliers
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA & Water Suppliers
b. Limit non-critical water consumption during severe drought conditions.	$0.00	County, Municipal & Water Suppliers
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County, All Municipalities & Water Suppliers
c. Conduct inventory of the county's emergency response services to identify any existing needs or shortfalls in terms of personnel, equipment, or required resources.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA & All Emergency Services Agencies in County
d. Investigate the need and feasibility of establishing a local reserve fund for repairing and/or incorporating hazard mitigation measures for public and private facilities and infrastructure that are at risk of being damaged or have been damaged by natural hazards.	$0.00	County, Municipal & Private
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County Commission & All Municipal Councils
e. Continue to research and provide hazard mitigation, emergency preparedness, and disaster recovery grant writing and/or administration services for available grant and loan programs (e.g., AFGP, FMA, HMGP, PDM, etc.).	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA , County Commission & All Municipalities

f. Investigate the need for and acquire emergency electrical power generation equipment to provide back-up emergency electrical power to critical facilities.	$150,000.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA , County Commission & All Municipalities
Total	**$150,000.00**	

Goal B: Provide on-going support of the Butler County Emergency Management efforts to make Butler County less vulnerable to natural disasters.

Objective B-1: Ensure that the Butler County Hazard Mitigation Plan remains current and is implemented.	**Estimated Cost Over 5 Years**	**Funding Source** / **Responsible Agency**
a. Update the Butler County Hazard Mitigation Plan every five years as required by regulations.	$7,000.00	Federal, State, & County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA & LEPC
b. Communicate with the general public at least annually to provide a status report of the plan and any project or programs that are a result of the plan and its implementation.	$12,500.00	County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA
c. Municipalities should provide local human resources or other resources, such as materials and supplies, to assist in implementation of the Butler County Hazard Mitigation Plan and its regular update.	$25,000.00	Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		All Municipalities
Total	**$44,500.00**	

Objective B-2: Improve coordination and communication between emergency response organizations and highly vulnerable entities.	**Estimated Cost Over 5 Years**	**Funding Source** / **Responsible Agency**
a. Designate a central emergency coordinator in each municipality and community to better facilitate communications with the Butler County Emergency Management Agency.	$0.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		County Commission & All Municipal Councils/Mayors
b. Provide for incident command training for the local emergency coordinators and other responders.	$2,000.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA
c. Develop an on-going cycle to provide regular updates to the Butler County Commission, municipal councils, fire protection and law enforcement officials, utility boards, and other emergency responders.	$7,500.00	County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA
Total	**$9,500.00**	

Objective B-3: Enhance the County's and municipalities' capability to conduct further hazard risk assessments, better demonstrate funding needs, and track mitigation activities throughout the County.	**Estimated Cost Over 5 Years**	**Funding Source** **Responsible Agency**
a. Continue to identify the County's most at-risk critical facilities, and evaluate the potential mitigation techniques and activities for protecting each facility to the maximum extent possible.	$0.00	County, Municipal & All Utilities
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA & LEPC, All County & Municipal departments, & All Utilities
b. Incorporate (or continue) development of a Geographic Information System (GIS) to maintain current cadastral and spatial data for purposes of inventorying critical facilities and infrastructure, conducting more detailed hazard risk assessments, and for tracking permitting and land use patterns.	$176,000.00	State, SCADC, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		State, SCADC, Butler Co. EMA, E-911, Tax Assessor, All County & Municipal Engineers & Building/Planning Officials, & All Utilities
Total	**$176,000.00**	

Goal C: Educate general population about natural hazards and hazard mitigation options.

Objective C-1: Establish and implement hazard mitigation public awareness program.	**Estimated Cost Over 5 Years**	**Funding Source** / **Responsible Agency**
a. Cooperate and coordinate with various agencies and entities to assist with distribution of information and materials, including the Greenville Area Chamber of Commerce, LBW Community College, DHR, Butler County Board of Education, churches, municipalities, etc.	$2,500.00	County, Municipal & Private
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA & the listed entities
b. Develop a portable information booth for display at local fairs and public events to distribute materials.	$5,500.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide		Butler Co. EMA
c. Create and distribute magnets that list all emergency contact information of local responding agencies.	$2,500.00	County, Municipal & Private
Geographic Beneficiaries & Jurisdictions: Countywide		Butler Co. EMA & All Municipalities
Total	**$10,500.00**	

Objective C-2: Establish and promote disaster prevention education programs, utilizing all forms of media (e.g., print, TV, internet websites - government and related non-governmental) to help distribute information and materials.	**Estimated Cost Over 5 Years**	**Funding Source** **Responsible Agency**
a. Investigate working with Butler County Extension System to develop adult training/certification courses on land management (best management practices) to decrease property damage during natural disaster events.	$20,000.00	USDA & County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA
b. Develop broadcast public service announcements for airing on local television and radio stations.	$15,000.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA
c. Develop print public service announcements for publication in local newspaper and agency newsletters.	$2,500.00	County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA
d. Develop information website with links from Butler County Commission and municipal websites.	$4,400.00	County, Municipal & Private
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA
e. Incorporate hazard awareness and mitigation into the curricula of local schools.	$7,000.00	State & County
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. Board of Education
f. Develop coloring and activity books at four appropriate age levels for widespread annual distribution.	$6,500.00	Federal, State, County & Municipal
Geographic Beneficiaries & Jurisdictions: Countywide and All Municipalities		Butler Co. EMA and Butler Co. Board of Education
Total	**$55,400.00**	

Butler County Hazard Mitigation Plan Five-Year Cost Summary

Mitigation Objective	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10
A-1. Establish full warning system	$109,000.00	$124,000.00	$124,000.00	$124,000.00	$124,000.00
A-2. Ensure adequate protection shelters	$44,000.00	$43,500.00	$43,500.00	$43,500.00	$43,500.00
A-3. Regulations to support hazard mitigation	$27,500.00	$27,500.00	$7,500.00	$7,500.00	$7,500.00
A-4. Fire protection measures	$0.00	$0.00	$0.00	$0.00	$0.00
A-5. Limit impact of heat and drought	$500.00	$500.00	$500.00	$500.00	$500.00
A-6. Improve infrastructure / Remove buildings	$2,500,000.00	$2,500,000.00	$2,500,000.00	$2,500,000.00	$2,500,000.00
A-7. Emergency services	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00
B-1. Implementation of Hazard Mitigation Plan	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$12,500.00
B-2. Coordination / Communication among emergency agencies	$1,900.00	$1,900.00	$1,900.00	$1,900.00	$1,900.00
B-3. Assessment Capability	$40,000.00	$34,000.00	$34,000.00	$34,000.00	$34,000.00
C-1. Public awareness program	$1,000.00	$1,000.00	$1,000.00	$6,000.00	$1,500.00
C-2. Disaster prevention education programs	$4,500.00	$10,600.00	$26,100.00	$7,100.00	$7,100.00
Total	**$2,766,400.00**	**$2,781,000.00**	**$2,776,500.00**	**$2,762,500.00**	**$2,762,500.00**
Grand Total					**$13,848,900.00**

Butler County Hazard Mitigation Plan Action Prioritization

In considering the appropriate precedence of mitigation activities to undertake, the Butler County LEPC reviewed the hazard profiles and prioritization, and the hazard risk assessment and vulnerability analysis. Though no formal cost-benefit analyses were conducted for each of the proposed mitigation actions, the LEPC did consider a variety of factors such as social impact, technical feasibility, financial costs, administrative capabilities, possible political and legal effects, as well as other issues. It was determined by the LEPC that all of the proposed actions would benefit citizens of Butler County and each of its municipalities. It was also decided that formal cost-benefit evaluations for specific actions should be completed when and if required (e.g., when applying for certain FEMA grant funds). Following this review and discussion, the following prioritization proposal was completed by the LEPC in order to assist the jurisdictions with the implementation of the Plan.

Mitigation Objective & Action	Hazard	Priority	Target Completion Date
A-1. Establish full warning system			
A-1-a. Installation of warning sirens	Tornados, Hurricanes/Tropical Storms, Severe Storms	High	October 1, 2009
A-1-b. Designate a central emergency coordinator in each community	All	High	July 1, 2005
A-1-c. Warning signage for forest fires	Wildfires	High	October 1, 2009
A-1-d. Investigate phone messaging system	All	High	January 1, 2006
A-2. Ensure adequate protection shelters			
A-2-a. Maintain & expand existing shelters	Tornados, Hurricanes/Tropical Storms, Severe Storms	High	Continuous
A-2-b. Designate and upgrade/retrofit existing public facilities to shelter capability	Tornados, Hurricanes/Tropical Storms, Severe Storms	Moderate	October 1, 2009
A-2-c. Investigate construction of new shelters	Tornados, Hurricanes/Tropical Storms, Severe Storms	Low	Continuous
A-2-d. Secure funds for private shelters	Tornados, Hurricanes/Tropical Storms, Severe Storms	High	Continuous

A-2-e. Work with builders to promote safe rooms	Tornados, Hurricanes/Tropical Storms, Severe Storms	Moderate	Continuous
A-2-f. Publicize shelters	All	High	Continuous
A-3. Regulations to support hazard mitigation			
A-3-a. Incorporate and enforce flood management provisions in all county and municipal regulations and ordinances	Flooding	High	Continuous
A-3-b. Ensure future land use plans do not extend into floodplains.	Flooding	High	Continuous
A-3-c. Develop long-range plan to address permitting and construction in unincorporated areas	All	Moderate	October 1, 2009
A-3-d. Adopt and enforce modern building codes	All	High	Continuous
A-3-e. Butler Co. EMA involvement in future development plans	All	Moderate	Continuous
A-3-f. Acquisition of properties in floodplains	Flooding	High	Continuous
A-4. Fire protection measures			
A-4-a. Develop and utilize zoning ordinances in urban fringe areas	Wildfires	High	Continuous
A-4-b. Education program on fire buffers and breaks	Wildfires	Moderate	January 1, 2006
A-4-c. Support Alabama Forestry Commission education efforts	Wildfires	Moderate	Continuous
A-5. Limit impact of heat and drought			
A-5-a. Implement water conservation and water quality education	Extreme Heat/Drought	Moderate	Continuous
A-5-b. Work with medical providers to develop emergency supplies and education program	Extreme Heat/Drought, All	High	October 1, 2005
A-5-c. Work with Butler Co. Farm Agency and County Ext. Svc. To est. a drought information center	Extreme Heat/Drought	High	October 1, 2005

A-5-d. Develop a drought plan and warning system	Extreme Heat/Drought	High	October 1, 2006
A-5-e. Develop print PSAs	Extreme Heat/Drought	Moderate	Continuous
A-6. Improve infrastructure			
A-6-a. Identify roads that are at risk of flood damage	Flooding	Moderate	Continuous
A-6-b. Continue bridge inspections and improvements	Flooding	High	Continuous
A-6-c. Maintain all county roads for emergency services	All	High	Continuous
A-6-d. Buy-out and relocation activities	All	High	Continuous
A-7. Emergency services			
A-7-a. Investigate need for emergency water supply during disasters	All	Moderate	Continuous
A-7-b. Limit non-critical water consumption during droughts	Extreme Heat/Drought	Moderate	Continuous
A-7-c. Inventory emergency response services and asses needs	All	High	October 1, 2005
A-7-d. Establish local reserve funds	All	High	October 1, 2006
A-7-e. Provide grant services	All	Moderate	Continuous
A-7-f. Assess need for and acquire emergency generators	All	High	Continuous
B-1. Implementation of Hazard Mitigation Plan			
B-1-a. Update Butler Co. Haz. Mit. Plan every five years	All	Moderate	October 1, 2010
B-1-b. Provide annual public reports on the status of the Plan's implementations	All	Moderate	Continuous
B-1-c. Municipalities to provide assistance for implementing Plan	All	High	Continuous
B-2. Coordination / Communication among emergency agencies			
B-2-a. Designate a central emergency coordinator in each community	All	High	July 1, 2005
B-2-b. Provide for incident command training	All	High	Continuous

B-2-c. Develop a system of providing regular updates to appropriate entities in the County	All	Moderate	Continuous
B-3. Assessment Capability			
B-3-a. Continue identifying critical facilities and evaluate mitigation techniques for each	All	High	Continuous
B-3-b. Incorporate/develop a GIS	All	High	Continuous
C-1. Public awareness program			
C-1-a. Coordinate with other entities to distribute information	All	Moderate	Continuous
C-1-b. Develop information booth	All	Moderate	October 1, 2008
C-1-c. Create and distribute information magnets	All	Moderate	Continuous
C-2. Disaster prevention education programs			
C-2-a. Develop land management course/training with the County Ext. Sys.	All	Moderate	October 1, 2008
C-2-b. Develop broadcast PSAs	All	Moderate	October 1, 2008
C-2-c. Develop print PSAs	All	Moderate	October 1, 2008
C-2-d. Butler Co. EMA website	All	Moderate	October 1, 2008
C-2-e. Incorporate hazard mitigation into local schools	All	Moderate	October 1, 2007
C-2-f. Coloring and activity books	All	Low	October 1, 2009

VI. PLAN MAINTENANCE AND REVIEW

The Butler County Natural Hazard Mitigation Plan was developed with the guidance of the Butler County Local Emergency Planning Committee so that the committee would be aware of the plan and its contents and, therefore, could ensure its ongoing implementation, review and amendment, as necessary. The Butler County LEPC is a standing committee comprised of members representing each of the local governments located in Butler County, along with both public and private representatives that have a vital stake in emergency management. The Butler County LEPC will meet on a regular basis for other emergency management matters. The continued review and update of the Butler County Natural Hazard Mitigation Plan shall become an additional responsibility of the Butler County LEPC.

The plan is developed on a five-year time frame. It is intended to be reviewed on an annual basis for any necessary amendments, and to undergo a major review and update every five years. In this way, Butler County will have an ongoing mitigation plan and process.

The Butler County EMA staff will continue to serve as the LEPC's facilitator responsible for holding regularly scheduled meetings, assigning specific tasks necessary to monitor and update the plan to Committee members, and serving as the Committee's liaison with those assigned implementation responsibilities. The facilitator will also serve as the Committee's liaison with participating municipalities and the County Commission. New committee members may be nominated by the EMA Director and then approved by the entire committee.

After the initial Butler County Natural Hazard Mitigation Plan is finalized and adopted, the LEPC shall meet at least once per year to review and update the plan, as necessary.

- Each member or a designated alternate must attend at least one meeting a year.
- A list of completed and ongoing mitigation projects will be reviewed at each meeting.
- Previously implemented mitigation actions will be evaluated for effectiveness.
- There will be an update on the status of current mitigation projects.
- Changing land use patterns and new developments will be addressed.
- Any additions or changes in risk assessment and/or risk vulnerability will be identified.
- Any other concerns will be addressed, possible future mitigation plans discussed, and any new projects will be adopted by signed resolution.

The facilitator will schedule the meetings at a time and location convenient to all of the LEPC members. All meetings will be advertised in the local newspaper and open to the public for their comments and suggestions.

In the event that modifications to the plan are required, the LEPC will oversee, recommend, and/or approve all revisions and amendments to the Butler County Natural Hazards Mitigation Plan. The LEPC will then submit all revisions, except for mitigation projects or activities not of a countywide nature, for adoption (via signed resolutions) by all of the jurisdictions. Any new projects (developed and/or proposed prior to the first five-year and between subsequent five-year major updates), not of a countywide nature, will be added to the Butler County Natural Hazards Mitigation Plan upon recommendation of the LEPC and adoption (via signed resolution) by the appropriate governing body where the proposed project is to be located. A copy of and/or access to any and all adopted plan revisions will be provided to all LEPC members, the County Commission, and each of the municipalities.

At the end of the five-year cycle of the Action Program, the Committee will oversee a major update to the plan that follows the Federal planning criteria in effect at the time of the update. The updated plan will again be submitted to the AEMA and FEMA for approval.

Implementation of the plan will be the responsibility of a number of local governments and agencies. For this reason, two public workshops were held to inform citizens about the contents of the plan. For each mitigation action item, a responsible agency has been identified. Furthermore, the implementation of the action items was outlined by year for the first five years. The Butler County Emergency Management Agency will coordinate implementation efforts with each of the local governments and with other agencies as necessary.

A critical part of maintaining an effective and relevant natural hazard mitigation plan is ongoing public review and comment. The LEPC is dedicated to direct involvement of its citizens in providing input on the plan throughout the five-year implementation cycle.

A hard copy of the plan will be available for viewing at all appropriate agencies throughout Butler County, at minimum to include: the Butler County Emergency Management Agency office, the Butler County Clerk's office, the offices of the Clerks of each municipality, and County or municipal government websites, if available. After adoption, a public information notice in the local newspaper will inform the public that the plan may be viewed at these locations.

Public meetings will be held when significant modifications to the plan are required or when otherwise deemed necessary by the LEPC. The public will be able to express their ideas, concerns, and opinions at the meetings. At a minimum, two public hearings will be held during the drafting stage of the five-year plan update and to present the final plan to the public before adoption.

If deemed appropriate by the Coordinator of the Butler County Emergency Management Agency and once adopted, this plan shall be considered as an Annex to the Butler County Emergency Operations Plan, which is administered through the Butler County Emergency Management Agency office. In addition to adopting the Butler County Natural Hazards Mitigation Plan in its entirety, it is recommended that each adopting jurisdiction incorporate this plan or its elements into their own respective existing or future planning documents, if and when appropriate. Examples of such existing or future planning documents may include, but are not limited to: countywide or municipal comprehensive and/or land use plans and regulations/ordinances; countywide or municipal floodplain management plans; countywide or municipal capital improvement plans and budgets; and any other county or municipal disaster, readiness, and/or contingency plans. The process and/or procedure used by each jurisdiction in adopting and incorporating the Butler County Natural Hazards Mitigation Plan or its elements into their own planning documents shall be the same as that delineated in the Code of Alabama and any applicable local ordinances and regulations. The Butler County EMA staff and/or the planning staff of the South Central Alabama Development Commission will provide technical assistance when requested.

Appendix A

Documentation of Jurisdictional Adoption and Planning and Public Involvement Process

Butler County
Emergency Management Agency

201 SOUTH CONECUH STREET, SUITE 104

GREENVILLE ALABAMA 36037

334-382-7911

May 25, 2004

Hon. Jesse McWilliams
Chairman, Butler County Commission
P.O. Box 756
Greenville, AL 36037-0756

Dear Chairman McWilliams:

The Butler County Emergency Management Agency, assisted by the South Central Alabama Development Commission, and with guidance from the Butler County Local Emergency Planning Committee, has completed a Natural Hazard Mitigation Plan for Butler County.

Please include discussion of this plan on the agenda of your upcoming commission meeting. I will be present at the meeting in order to answer any questions the County Commission may have in regards to the plan.

Attached is a draft of the Natural Hazard Mitigation Plan, along with a resolution for adoption. Federal legislation requires adoption by all jurisdictions covered by the plan in order for the Federal Emergency Management Agency to formally recognize its contents.

Please feel free to contact me if you have any questions or require additional information.

Sincerely,

Bob Luman
Coordinator, Butler County EMA

A RESOLUTION TO ADOPT
THE BUTLER COUNTY NATURAL HAZARD MITIGATION PLAN

WHEREAS, the Butler County Emergency Management Agency has engaged in extensive studies of the natural hazards facing Butler County; and,

WHEREAS, the Butler County Emergency Management Agency, with guidance from the Butler County Local Emergency Planning Committee, has prepared a Natural Hazard Mitigation Plan; and,

WHERAS, the Butler County Commission is formally represented by a delegation on the Butler County Local Emergency Planning Committee; and,

WHEREAS, the goals of this plan are to reduce the loss of life, decrease repetitive property losses due to disasters, and provide leadership and coordination to encourage all levels of government and public and private organizations in Butler County to undertake mitigation in minimizing potential disasters and to employ mitigation in the recovery following disasters; and,

WHEREAS, the strategies of this plan are to identify and characterize hazards, assess risk, prioritize and implement mitigation measures; and,

WHEREAS, the adoption of the Butler County Natural Hazard Mitigation Plan would be in the best interest and protection of the Citizens of Butler County; and,

NOW THEREFORE BE IT RESOLVED by The County Commission of Butler County, Alabama that the document entitled the Butler County Natural Hazard Mitigation Plan and all official maps pertaining thereto are hereby adopted this 9th day of Aug, 2004.

ADOPTED and APPROVED by the County Commission of Butler County, Alabama on the 9th of Aug, 2004.

Delivered to and approved by the County Commission Chairman on this 9th day of Aug, 2004.

Jesse McWilliams

Jesse McWilliams, Chairman

Attest:

Diane Kilpatrick

Diane Kilpatrick, Clerk/Administrator

8-9-04

Date

Butler County
Emergency Management Agency

201 SOUTH CONECUH STREET, SUITE 104

GREENVILLE ALABAMA 36037

334-382-7911

May 25, 2004

Hon. Lynn Watson
Mayor of Georgiana
P.O. Box 310
Georgiana, AL 36033-0310

Dear Mayor Watson:

The Butler County Emergency Management Agency, assisted by the South Central Alabama Development Commission, and with guidance from the Butler County Local Emergency Planning Committee, has completed a Natural Hazard Mitigation Plan for Butler County.

Please include discussion of this plan on the agenda of your upcoming Town Council meeting. I will be present at the meeting in order to answer any questions the Town Council may have in regards to the plan.

Attached is a draft of the Natural Hazard Mitigation Plan, along with a resolution for adoption. Federal legislation requires adoption by all jurisdictions covered by the plan in order for the Federal Emergency Management Agency to formally recognize its contents.

Please feel free to contact me if you have any questions or require additional information.

Sincerely,

Bob Luman
Coordinator, Butler County EMA

A RESOLUTION TO ADOPT
THE BUTLER COUNTY NATURAL HAZARD MITIGATION PLAN

WHEREAS, the Butler County Emergency Management Agency has engaged in extensive studies of the natural hazards facing Butler County; and,

WHEREAS, the Butler County Emergency Management Agency, with guidance from the Butler County Local Emergency Planning Committee, has prepared a Natural Hazard Mitigation Plan; and,

WHERAS, the Town of Georgiana is formally represented by a delegation on the Butler County Local Emergency Planning Committee; and,

WHEREAS, the goals of this plan are to reduce the loss of life, decrease repetitive property losses due to disasters, and provide leadership and coordination to encourage all levels of government and public and private organizations in Butler County to undertake mitigation in minimizing potential disasters and to employ mitigation in the recovery following disasters; and,

WHEREAS, the strategies of this plan are to identify and characterize hazards, assess risk, prioritize and implement mitigation measures; and,

WHEREAS, the adoption of the Butler County Natural Hazard Mitigation Plan would be in the best interest and protection of the Citizens of the Town of Georgiana; and,

NOW THEREFORE BE IT RESOLVED by The Town Council of the Town of Georgiana, Alabama that the document entitled the Butler County Natural Hazard Mitigation Plan and all official maps pertaining thereto are hereby adopted this 3rd day of August, 2004.

ADOPTED and APPROVED by the Town Council of Town of Georgiana, Alabama on the 3rd of August, 2004.

Delivered to and approved by the Mayor on this 3rd day of August, 2004.

Lynn H. Watson

Lynn H. Watson, Mayor

Attest:

Barbara Clem

Barbara Clem, Clerk

August 3, 2004

Date

Butler County
Emergency Management Agency

201 SOUTH CONECUH STREET, SUITE 104

GREENVILLE ALABAMA 36037

334-382-7911

May 25, 2004

Hon. Dexter McLendon
Mayor of Greenville
P.O. Box 158
Greenville, AL 36037-0158

Dear Mayor McLendon:

The Butler County Emergency Management Agency, assisted by the South Central Alabama Development Commission, and with guidance from the Butler County Local Emergency Planning Committee, has completed a Natural Hazard Mitigation Plan for Butler County.

Please include discussion of this plan on the agenda of your upcoming City Council meeting. I will be present at the meeting in order to answer any questions the City Council may have in regards to the plan.

Attached is a draft of the Natural Hazard Mitigation Plan, along with a resolution for adoption. Federal legislation requires adoption by all jurisdictions covered by the plan in order for the Federal Emergency Management Agency to formally recognize its contents.

Please feel free to contact me if you have any questions or require additional information.

Sincerely,

Bob Luman
Coordinator, Butler County EMA

RESOLUTION 2004-54

A RESOLUTION TO ADOPT THE BUTLER COUNTY NATURAL HAZARD MITIGATION PLAN.

WHEREAS, the Butler County Emergency Management Agency has engaged in extensive studies of the natural hazards facing Butler County, and

WHEREAS, the Butler County Emergency Management Agency, with guidance from the Butler County Local Emergency Planning Committee, has prepared a Natural Hazard Mitigation Plan, and

WHEREAS, the City of Greenville is formally represented by a delegate on the Butler County Local Emergency Planning Committee, and

WHEREAS, the goals of this plan are to reduce the loss of life, decrease repetitive property losses due to disasters, and provide leadership and coordination to encourage all levels of government and public and private organizations in Butler County to undertake mitigation in minimizing potential disasters and to employ mitigation in the recovery following disasters, and

WHEREAS, the strategies of this plan are to identify and characterize hazards, assess risk, prioritize and implement mitigation measures, and

WHEREAS, the adoption of the Butler County Natural Hazard Mitigation Plan would be in the best interest and protection of the Citizens of the City of Greenville.

NOW, THEREFORE BE IT RESOLVED by the City Council of the City of Greenville, Alabama that the document entitled the *Butler County Natural Hazard Mitigation Plan* and all official maps pertaining thereto are hereby adopted this 9th day of August, 2004.

ADOPTED and **APPROVED** by the City Council of the City of Greenville, Alabama on this 9th day of August, 2004.

Dexter McLendon, Mayor

Attest:

Linda L. VandenBosch, City Clerk-Treasurer

Butler County
Emergency Management Agency

201 SOUTH CONECUH STREET, SUITE 104

GREENVILLE ALABAMA 36037

334-382-7911

May 25, 2004

Hon. Betty Stinson
Mayor of McKenzie
P.O. Box 151
McKenzie, AL 36456-0151

Dear Mayor Stinson:

The Butler County Emergency Management Agency, assisted by the South Central Alabama Development Commission, and with guidance from the Butler County Local Emergency Planning Committee, has completed a Natural Hazard Mitigation Plan for Butler County.

Please include discussion of this plan on the agenda of your upcoming Town Council meeting. I will be present at the meeting in order to answer any questions the Town Council may have in regards to the plan.

Attached is a draft of the Natural Hazard Mitigation Plan, along with a resolution for adoption. Federal legislation requires adoption by all jurisdictions covered by the plan in order for the Federal Emergency Management Agency to formally recognize its contents.

Please feel free to contact me if you have any questions or require additional information.

Sincerely,

Bob Luman
Coordinator, Butler County EMA

A RESOLUTION TO ADOPT
THE BUTLER COUNTY NATURAL HAZARD MITIGATION PLAN

WHEREAS, the Butler County Emergency Management Agency has engaged in extensive studies of the natural hazards facing Butler County; and,

WHEREAS, the Butler County Emergency Management Agency, with guidance from the Butler County Local Emergency Planning Committee, has prepared a Natural Hazard Mitigation Plan; and,

WHERAS, the Town of McKenzie is formally represented by a delegation on the Butler County Local Emergency Planning Committee; and,

WHEREAS, the goals of this plan are to reduce the loss of life, decrease repetitive property losses due to disasters, and provide leadership and coordination to encourage all levels of government and public and private organizations in Butler County to undertake mitigation in minimizing potential disasters and to employ mitigation in the recovery following disasters; and,

WHEREAS, the strategies of this plan are to identify and characterize hazards, assess risk, prioritize and implement mitigation measures; and,

WHEREAS, the adoption of the Butler County Natural Hazard Mitigation Plan would be in the best interest and protection of the Citizens of the Town of McKenzie; and,

NOW THEREFORE BE IT RESOLVED by The Town Council of the Town of McKenzie, Alabama that the document entitled the Butler County Natural Hazard Mitigation Plan and all official maps pertaining thereto are hereby adopted this 2nd day of AUGUST, 2004.

ADOPTED and APPROVED by the Town Council of the Town of McKenzie, Alabama on the 2nd of AUGUST, 2004.

Delivered to and approved by the Mayor on this 2nd day of AUGUST, 2004.

Betty W. Stinson
Betty W. Stinson, Mayor

Attest:

Tina Pate
Tina Pate, Clerk

8-02-04
Date

Butler County Hazard Mitigation Plan
Local Emergency Planning Committee
Meeting 1 Summary
March 23, 2004

The Butler County Local Emergency Planning Committee met on Tuesday, March 23, 2004, at 2:00 p.m. at the Beeland Park YMCA in Greenville, Alabama. Attendance/LEPC registration forms were distributed to all attendees, who were then asked to return the completed forms to Mr. Bob Luman, Coordinator of the Butler County Emergency Management Agency, at the end of the meeting. Under the sixth item listed on the regular agenda (see attached) of the Committee, Mr. Luman explained that the County EMA is in the process of developing a multi-jurisdictional hazard mitigation plan for Butler County and the municipalities of Georgiana, Greenville, and McKenzie. Mr. Luman also explained that new Federal Emergency Management Agency (FEMA) requirements state that for an area to remain eligible for certain FEMA funds in case of a declared disaster after November 1, 2004, the locality must have an adopted hazard mitigation plan in place. Further, Mr. Luman introduced Mr. Patrick Tritz, with the South Central Alabama Development Commission, who have been contracted to assist with the development of the plan.

After a brief introduction, Mr. Tritz thanked the attendees for being in attendance and provided several handouts (copies attached), the first of which was a brief overview of the hazard mitigation planning process. Mr. Tritz then discussed a flow chart showing the 10-Step Planning Process and the tentative project schedule, noting that a draft of the plan is slated to be complete by mid-May and available for local review prior to submission to the Alabama Emergency Management Agency (AEMA) in June. He also presented a tentative schedule for both the LEPC and for two countywide public workshops, which will be held on Monday, April 12, at the Beeland YMCA at 2:00 p.m., and the week of May 17 (tentative). The purpose of the first public meeting will be to introduce the public the hazard mitigation planning process and to present the identification and assessment of hazards and the vulnerability analysis and risk assessment. Public comments and suggestions for the mitigation strategy will also be obtained at the first public meeting. At the second public workshop, a draft of the Butler County Hazard Mitigation Plan will be presented for public review and comments.

The next handout Mr. Tritz discussed was the list of 16 natural hazards, entitled *Hazard Identification*. He asked attendees to review the hazard and then mark the hazard as it pertains to Butler County as not applicable or as a Priority 1, 2, or 3 hazard (1 being the greatest). After attendees complete that form, Mr. Tritz asked that attendees then complete the form entitled *Problem Assessment – Hazard Impacts* for each of the top six hazard priorities as they individually determined using the *Hazard Identification* form. He explained that samples of completed assessments were attached for selected types of natural hazards, if needed, and that additional *Assessment* forms were available if needed. Mr. Tritz also cited that a list of various Butler County weather events obtained from the National Climatic Data Center (NCDC) to show what types of natural hazards the County has experienced since the 1950s.

Lastly, Mr. Tritz explained the *Critical Facility Identification* and the *Natural Hazard Mitigation Goals* forms. He explained that at the present, specific addresses were not needed on the form, especially if the individual attendee did not feel comfortable with or was prohibited from doing so, due to security concerns. As for goals, Mr. Tritz explained that attendees needed to start thinking about what goal the wished to see in the plan and that these goals will help drive the strategies to be developed later in the planning process.

In conclusion, Mr. Tritz stated that at each of the meetings, there would probably be some form of "homework" for discussion at the following meeting. He also noted that in the back of the room were some working maps that identified hazard patterns in Butler County if committee members would like to look at them before leaving.

In conclusion of his allotted time, Mr. Tritz stated that the materials provided could be taken as "homework", however, that the completed forms were going to be needed as soon as possible for continued plan development and for discussion at the next LEPC meeting. He also stated that hazard profiles and maps should be available at the next committee meeting.

Questions and answers were then fielded, of which there was one concerning the use of similar plans that have been developed by other counties. Mr. Michael Johnson, of Jacksonville State University's Institute for Emergency Preparedness, explained that it would be fine to review other plans, but that each plan has to be tailored to the individual counties. Mr. Tritz replied by echoing Mr. Johnson's statements, and by citing that the plans of other counties were being reviewed, but that Butler County's plan was not and should not be a mirror copy of any other county's plan. He further explained that what hazards or events may occur in one county (e.g., Mobile) may not occur in north Alabama, and vice versa.

After some brief discussion of LEPC and Butler County EMA administrative matters, the next LEPC meeting was scheduled for Tuesday, April 20, 2:00 p.m. at the Beeland YMCA.

Mr. Luman then adjourned the meeting.

Butler County Hazard Mitigation Plan
Local Emergency Planning Committee
Public Workshop Meeting 1 Summary
April 12, 2004

The Butler County Emergency Management Agency hosted a countywide public workshop on Monday, April 12, 2004 at 2:00 p.m. at the Beeland Park YMCA in Greenville, Alabama. A total of nine persons attended. An attendance roster, agenda, and information package were available upon arrival and are available upon request. This was the first in a series of two public workshops planned to assist with the development of the Butler County Natural Hazards Mitigation Plan. Mr. Bob Luman, Coordinator of the Butler County Emergency Management Agency, opened the meeting and explained that the purpose of the plan. He introduced Mr. Patrick Tritz, of the South Central Alabama Development Commission (SCADC), which has been retained to assist in the development of the plan. He then turned the meeting over to Mr. Tritz to present information gathered to-date for the planning process.

Mr. Tritz thanked all citizens in attendance and then explained that the hazard mitigation planning process is an on-going and cyclical process consisting of ten basic steps. He stated that currently the Butler County Emergency Management Agency is approximately in Steps 4, 5 and 6 and is assessing the hazard and problems and setting goals. He explained the role of the Local Emergency Planning Committee (LEPC) and the representation of organizations on the committee. Mr. Tritz then explained the schedule for the project, including LEPC meeting times and the date and purpose of the next public workshop.

Mr. Tritz then presented a geographic and demographic profile of Butler County, showing slides of Butler County's regional location, elevation, geological formations, and land use and cover. Discussion followed about the correlation between elevation and floodplains. Demographic information included total population, population by gender, population by age, and population by race. Mr. Tritz pointed out that Butler County has a slightly higher percentage of female population than most areas of the State of Alabama and a slightly younger population than most areas of the state, as well.

Information on past natural disasters was presented, and particularly those from the past eight years. Mr. Tritz presented slides showing past tropical cyclone paths and existing floodplains. Discussion followed about Garland area in southwest Butler County. Several attendees commented that the Garland community seems to experience several flood or flood-related incidents, such as road and bridge washing which would be attributable to unstable soils in the area. Information was then presented regarding the draft Vulnerability Analysis for the Butler County Plan, which shows that Butler County is most vulnerable to severe storms and tornados, followed by drought, fires, floods, and tropical events. Mr. Tritz then presented a draft hazard identification and ranking that is based on the hazard information gathered to-date.

Mr. Tritz then provided a list of possible impacts of four of Butler County's major hazards using a list of criteria provided by the Alabama Emergency Management Agency and the Federal

Emergency Management Agency. He also presented a list of potential critical facilities that had been identified by him, so far. He then asked those in attendance to identify any additional sites, and at least one attendee suggested adding the various fertilizer and hardware supply sites in the County.

In the final portion of the meeting, Mr. Tritz explained the definition of a goal in terms of hazard mitigation planning and presented six preliminary goals that had been developed for the Butler County Hazard Mitigation Plan. He then asked if there were any recommendations for editing or adding to the list. He then asked citizens to refer to the comment form that was included as a part of their information package, and he asked them to take a few minutes to complete the form and leave them or to return it to Mr. Luman as soon as possible. He also asked citizens to make any additional comments, list additional hazard impacts and suggestions for goals on the back of the comment form. Mr. Tritz asked if there were any additional comments that any citizen would like to make. He also reminded everyone that the hazard identification and threat prioritization lists, the hazard impacts lists, and the critical facilities list were all drafts and that that he and Mr. Luman were still awaiting the responses and additional input from the LEPC and other local officials. With there being no additional comments, Mr. Tritz reminded attendees to complete the comment forms prior to leaving and to take extra copies to share with their friends, families, and coworkers. Mr. Luman then adjourned the meeting at approximately 3:00 p.m.

Butler County Hazard Mitigation Plan
Local Emergency Planning Committee
Meeting 2 Summary
April 20, 2004

The Butler County Local Emergency Planning Committee met on Tuesday, April 20, 2004, at 2:00 p.m. at the Beeland Park YMCA in Greenville, Alabama. Fifteen persons were in attendance. Mr. Bob Luman, Coordinator of the Butler County Emergency Management Agency, opened the meeting and discussed a couple of other ongoing planning efforts (i.e., EOP, SNS, etc.) and Butler EMA activities before discussion began on the mitigation plan. At this point, Mr. Luman reintroduced Mr. Patrick Tritz, with the South Central Alabama Development Commission, who have been contracted to assist with the development of the plan.

After a very brief reintroduction, Mr. Tritz thanked the attendees for being in attendance and provided a packet of handouts (copies attached) to all present. Mr. Tritz also introduced Mr. Griffin Powell, also of SCADC. The packets included: a meeting agenda; a copy of the hazard identification and prioritization sheet (initially provided at the 3/23/04 LEPC meeting); a list of possible goals for the plan; summaries of the 3/24/04 LEPC and the 4/12/04 public meetings; a copy of the PowerPoint slide presentation shown at the 4/12/04 public meeting; an initial list of critical facilities provided at the 4/12/04 public meeting; and a copy of the 4/12/04 public meeting comment form.

First, Mr. Tritz went over where the County was approximately in the mitigation planning process. Specifically, he said that the County was still assessing hazards, setting goals, and was about to begin developing an action plan/strategy. He then went on to state that no information or data had been received from any of the 3/24/04 LEPC attendees as asked for in the handouts distributed at that meeting. Mr. Tritz also discussed the results of the first public meeting (see the 4/12/04 public meeting summary). At this time, he also quickly ran through the slide presentation shown at that meeting.

LEPC members were also presented with a list of known historical and current plans, ordinances, and studies that were prepared for the County and its municipalities. Mr. Tritz stated that these plans were researched for ideas and relevance in terms of disaster mitigation and preparedness. Mr. Tritz further said that the information collected would be used to help identify hazards and risks, determine vulnerabilities, and provide ideas for mitigation strategies and activities. A short list of findings were presented, which concluded that there was especially little data or information directly related toward hazard mitigation. He stated that existing information from this review included limited police and fire protection service issues and needs, road and bridge improvements, and limitations to development in flood-prone areas. This review also resulted in a short list of available tools that can be utilized to facilitate or complement current and future hazard mitigation activities. These tools include flood damage prevention ordinances, storm water management guidelines, subdivision regulations, zoning ordinances, capital improvement programs, and proposed dangerous buildings ordinances.

Next, Mr. Tritz made another request for copies of any additional existing plans and/or information from any of the organizations represented on the LEPC. Mr. Tritz noted that nothing substantial had been received from the LEPC members to-date. He also asked for lists of any critical facilities and any estimated values of such structures to include in the plan. Mr. Tritz re-emphasized that he and the County realizes that some information may be "sensitive" and should not be made available to the general public. He explained that in other plans, such information could be limited to only the copy of the plan kept in the EMA offices, and that public copies of the plan can exclude such data.

The plan's preliminary goals were discussed next. Mr. Tritz added that if any of the proposed goals need to edited, deleted, or add to, to please do so. He further asked for suggestions as to objectives and specific activities or projects for the plan. At the time, there was no input, so he asked the attendees to mull over the matter and give him or Mr. Luman their feedback when convenient.

In conclusion, Mr. Tritz stated that the materials provided could again be taken as "homework", however, that the completed forms were going to be needed as soon as possible for continued plan development and for discussion at the next LEPC meeting. He also stated that he would try to have a draft plan ready for the LEPC's review at the next meeting. Mr. Luman then reiterated the need for any information from any of the participating organizations' own plans and activities that would be useful for the County's plan.

The next LEPC and public meeting dates were still being planned and will be announced as soon as possible.

No questions were asked, so Mr. Luman then adjourned the meeting at approximately 2:55 p.m.

Butler County Hazard Mitigation Plan
Local Emergency Planning Committee
Meeting 3 Summary
May 18, 2004

The Butler County Local Emergency Planning Committee met on Tuesday, May 18, 2004, at 2:00 p.m. at the Beeland Park YMCA in Greenville, Alabama. Twelve persons were in attendance. Mr. Bob Luman, Coordinator of the Butler County Emergency Management Agency, opened the meeting and reintroduced Mr. Patrick Tritz, with the South Central Alabama Development Commission, who have been contracted to assist with the development of the plan.

Mr. Tritz thanked the attendees for being in attendance and provided a copy of the first draft of the Butler County Natural Hazards Mitigation Plan to all present. He emphasized that the draft was an initial draft and that he and Griffin Powell (of SCADC) still have some "holes" to fill in the Plan as well as edit and polish other areas in the document.

Mr. Tritz briefly reviewed the Critical Facilities list, the Action Plan/Strategy, and the chapter on Plan Maintenance and updates. Afterwards, he asked for comments and questions. A few comments were received from several of the attendees.

Mr. Tritz then reminded everyone that the next public meeting and workshop is scheduled for Tuesday, May 25 at the same time and location. He also further explained the various plan deadlines and that every municipality will need to adopt the plan if they desire to remain eligible for specific types of future FEMA assistance.

In conclusion, Mr. Tritz asked that the meeting's participants review the draft plan and submit any comments and edits to Mr. Luman, Mr. Powell, or himself by the end of the week or by Monday, May 24.

Mr. Luman then reviewed the status of the EOP, SNS plan, and other EMA activities that have occurred since the last LEPC meeting.

With no further questions or comments made, Mr. Luman adjourned the meeting at approximately 2:25 p.m.

Butler County Hazard Mitigation Plan
Local Emergency Planning Committee
Public Workshop Meeting 2 Summary
May 25, 2004

The Butler County Emergency Management Agency hosted a countywide public workshop on Tuesday, May 25, 2004 at 2:00 p.m. at the Beeland Park YMCA in Greenville, Alabama. A total of eleven persons attended. An attendance roster is available upon request. This was the second in a series of two public workshops planned to assist with the development of the Butler County Natural Hazards Mitigation Plan. Mr. Bob Luman, Coordinator of the Butler County Emergency Management Agency, opened the meeting and explained that the purpose of the plan. He reintroduced Mr. Patrick Tritz, of the South Central Alabama Development Commission (SCADC), which has been retained to assist in the development of the plan. He then turned the meeting over to Mr. Tritz.

Mr. Tritz thanked all citizens in attendance as he distributed copies of the latest Plan draft. He also distributed a comment form to each individual. It was then explained that the draft distributed at this meeting is the latest version with revisions made as early as "this morning". For those LEPC members in attendance, Mr. Tritz explained that this draft included additional maps and text, as well as more supplementary materials and project/activity ideas.

Mr. Tritz then urged all attendees to take as long as they needed to review the current draft and make any comments as necessary. He also explained that if attendees would like their own copies of the plan (since not enough copies were available for every person in attendance) that they can leave a mailing address or email address and that SCADC would send them a copy as soon as possible.

He then explained that the plan is to have whatever the latest version of the draft plan sent to AEMA on Friday, May 28, and that it should arrive at AEMA in Clanton by June 1. Mr. Tritz mentioned that the draft plan sent will not be "100% complete" since he is still waiting for additional information from a handful of agencies/organizations that should be included in the Plan. An example of such information he cited are structural/asset estimates from utilities and local governments. Mr. Tritz stated that he would try to include a memo with the draft copy sent to AEMA that would basically state that the submitted draft was incomplete, but that the County would continue to try and "fill in the holes beyond June 1 and before November". He then stated that after official comments/suggestions have been received from AEMA and FEMA, that the Plan would be ready for adoption by the County Commission and each of the municipalities.

With that said, Mr. Tritz opened up the meeting for public comments and questions. In the meantime, he urged attendees to continue reviewing the draft at their leisure.

At least two comments were provided concerning the critical facilities list and the assets list and strategy. Both comments were also noted on the respective comment forms given back by the originators and the suggestions have been or are being made to the draft plan.

Attendees began to leave at approximately 2:25 p.m. After all had departed, Mr. Luman then adjourned the meeting at approximately 2:40 p.m.

Appendix B

Inventory of Existing Conditions and Supplementary Information

Storm Events

Major storm event data was obtained from the National Climatic Data Center (NCDC) – a subordinate unit of the National Oceanic & Atmospheric Administration (which is itself an agency under the U.S. Department of Commerce). Additional information for tornados was obtained from the Birmingham, Alabama office of the National Weather Service (NWS) – another subordinate unit of NOAA.

Sources:

A. Originators: NCDC, NOAA, DOC
Accessed: March 19 and May 25, 2004
Title: Storm Events for Alabama
Website: http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms.

B. Originators: Birmingham Office, NWS, NOAA, DOC
Accessed: May 14, 2004
Title: Alabama Tornado Database
Publication Date: April 14, 2003
Website: http://www.srh.noaa.gov/bmx/tornadoes/index.html.

Storm Events

for Alabama

Enter Search Parameters for Alabama

Begin Date: 01/01/1950 * 01/01/1950 thru 01/31/2004

End Date: 01/31/2004 *If Different from Begin Date*

County:

Event Type: *All

Limit Search Results

Tornados :

Hail, Size of at Least: Inches

High Wind Speed of at Least: Knots

Number of Injuries :

Number Of Deaths

Amount of Property Damage $:

Amount of Crop Damage $:

List Storms | Reset | New State | All States

Fujita Tornado Scale

F0: 40-72 mph (35-62 kt)
F1: 73-112 mph (63-97 kt)
F2: 113-157 mph (98-136 kt)
F3: 158-206 mph (137-179 kt)
F4: 207-260 mph (180-226 kt)
F5: 261-318 mph (227-276 kt)

Reference Notes

*** Begin Date is Required to List Storms. Enter dates as MM/DD/YYYY. Search the NCDC Storm Event database to find various types of storms recorded in your county or use other selection criteria as desired. The database currently contains:**

The Storm Events Database contains data from the following sources:

All Weather Events from 1993 - 1995, as entered into Storm Data. (Except 6/93 - 7/93, which is missing) (NO Latitude/Longitude)

All Weather Events from 1996 - Current, as entered into Storm Data. (Including Latitude/Longitude)

Plus additional data from the Storm Prediction Center; Including

- **Tornadoes 1950-1992**
- **Thunderstorm Winds 1955-1992**
- **Hail 1955-1992**

The Storm Events Database is updated when the data becomes available to NCDC.
The data is updated on a monthly basis and is usually 90-120 days behind the current month

Please do not contact NCDC with requests for information about specific weather events. All of the data is received from the National Weather Service and is made available as soon as possible. If you cannot locate a particular event 120 days after the end of the month of occurrence, contact Stuart Hinson.

This page dynamically generated 25 May 2004 from:
http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~storms
Please send questions or comments about this system to ron.ray@noaa.gov
Please see the NCDC Contact Page if you have questions or comments.

Query Results

112 event(s) were reported in **Butler County, Alabama** between **01/01/1950** and **12/31/2003** (**High Wind limited to speed greater than 0 knots)**.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Alabama								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 BUTLER	06/28/1957	1015	Tornado	F2	0	0	250K	0
2 BUTLER	06/28/1957	1100	Tornado	F2	0	0	250K	0
3 BUTLER	07/04/1960	1750	Tornado	F0	0	0	0K	0
4 BUTLER	07/04/1960	1750	Tornado	F0	0	0	0K	0
5 BUTLER	10/04/1964	1020	Tornado	F1	0	0	25K	0
6 BUTLER	12/24/1964	1935	Tornado	F2	0	0	25K	0
7 BUTLER	12/26/1964	1000	Tornado	F1	0	0	3K	0
8 BUTLER	04/18/1969	0230	Tornado	F4	2	11	250K	0
9 BUTLER	04/07/1973	0830	Tstm Wind	0 kts.	0	0	0	0
10 BUTLER	06/17/1973	1245	Tornado	F1	0	0	0K	0
11 BUTLER	04/18/1978	0730	Tstm Wind	0 kts.	0	0	0	0
12 BUTLER	04/18/1978	1730	Tstm Wind	0 kts.	0	0	0	0
13 BUTLER	11/17/1978	1845	Tstm Wind	0 kts.	0	0	0	0
14 BUTLER	11/25/1979	1210	Tornado	F2	0	0	25K	0
15 BUTLER	03/30/1981	0315	Tstm Wind	0 kts.	0	0	0	0
16 BUTLER	04/01/1981	0830	Tstm Wind	0 kts.	0	0	0	0
17 BUTLER	03/20/1983	1310	Tornado	F1	0	0	0K	0
18 BUTLER	03/20/1983	1315	Tstm Wind	0 kts.	0	0	0	0
19 BUTLER	12/06/1983	0430	Tstm Wind	0 kts.	0	0	0	0

20 BUTLER	08/01/1984	1440	Tstm Wind	0 kts.	0	0	0	0
21 BUTLER	04/15/1985	1600	Hail	0.75 in.	0	0	0	0
22 BUTLER	04/15/1985	1600	Tstm Wind	0 kts.	0	0	0	0
23 BUTLER	08/24/1985	1830	Tstm Wind	0 kts.	0	0	0	0
24 BUTLER	02/10/1986	1440	Tstm Wind	0 kts.	0	0	0	0
25 BUTLER	07/25/1987	1750	Tstm Wind	0 kts.	0	0	0	0
26 BUTLER	05/24/1988	1235	Hail	1.00 in.	0	0	0	0
27 BUTLER	05/24/1988	1300	Hail	0.75 in.	0	0	0	0
28 BUTLER	06/05/1989	1515	Tstm Wind	0 kts.	0	0	0	0
29 BUTLER	09/02/1989	1500	Tstm Wind	0 kts.	0	0	0	0
30 BUTLER	09/02/1989	1500	Tstm Wind	0 kts.	0	0	0	0
31 BUTLER	01/25/1990	0500	Tstm Wind	0 kts.	0	0	0	0
32 BUTLER	02/10/1990	0420	Tstm Wind	0 kts.	0	0	0	0
33 BUTLER	02/16/1990	0915	Tstm Wind	0 kts.	0	0	0	0
34 BUTLER	04/01/1990	1715	Tstm Wind	0 kts.	0	0	0	0
35 BUTLER	04/28/1990	1055	Hail	1.75 in.	0	0	0	0
36 BUTLER	04/28/1990	1100	Hail	1.75 in.	0	0	0	0
37 BUTLER	12/03/1990	0920	Tstm Wind	0 kts.	0	0	0	0
38 BUTLER	03/01/1991	1315	Tstm Wind	0 kts.	0	0	0	0
39 BUTLER	04/29/1991	1155	Hail	1.75 in.	0	0	0	0
40 BUTLER	04/29/1991	1155	Tstm Wind	0 kts.	0	0	0	0
41 BUTLER	04/29/1991	1215	Hail	1.75 in.	0	0	0	0
42 BUTLER	01/13/1992	1447	Tstm Wind	0 kts.	0	0	0	0
43 BUTLER	04/20/1992	1400	Tstm Wind	0 kts.	0	0	0	0
44 BUTLER	04/20/1992	1405	Tstm Wind	0 kts.	0	0	0	0

45 BUTLER	05/26/1992	1625	Tstm Wind	0 kts.	0	0	0	0
46 BUTLER	11/04/1992	0900	Tstm Wind	0 kts.	0	0	0	0
47 BUTLER	04/15/1993	0700	Thunderstorm Winds	N/A	0	0	0	0
48 Greenville	07/22/1994	1540	Thunderstorm Winds	N/A	0	0	50K	0
49 BUTLER	04/11/1995	2210	Hail	1.75 in.	0	0	0	0
50 Georgiana	04/23/1995	1515	Hail	0.75 in.	0	0	0	0
51 Foster Flats	07/17/1995	1305	Tornado F0	F	0	0	1K	0
52 Southwest And South A	10/03/1995	1200	Hurricane Opal	N/A	0	0	48.0M	4.0M
53 Georgiana	10/04/1995	1850	Tornado	F0	0	0	10K	0
54 Greenville	12/01/1996	01:15 AM	Tstm Wind	50 kts.	0	0	2K	0
55 Georgiana	12/16/1996	08:50 PM	Tstm Wind	50 kts.	0	0	2K	0
56 Georgiana	01/24/1997	07:00 AM	Tstm Wind	50 kts.	0	0	3K	0
57 Greenville	03/29/1997	05:55 PM	Hail	0.75 in.	0	0	0	0
58 Greenville	03/29/1997	07:05 PM	Hail	0.75 in.	0	0	0	0
59 Georgiana	04/22/1997	07:10 PM	Hail	0.75 in.	0	0	0	0
60 Georgiana	04/22/1997	07:10 PM	Tstm Wind	50 kts.	0	0	2K	0
61 Mc Kenzie	05/28/1997	06:35 PM	Tstm Wind	50 kts.	0	0	2K	0
62 Garland	05/28/1997	09:00 PM	Flash Flood	N/A	0	0	2K	0
63 Greenville	10/25/1997	12:30 PM	Tornado	F0	0	0	4K	0
64 Greenville	11/21/1997	05:25	Tstm Wind	50	0	0	3K	0

		PM		kts.				
65 Greenville	01/07/1998	10:30 AM	Tstm Wind	50 kts.	0	0	4K	0
66 Greenville	03/08/1998	01:03 AM	Hail	0.75 in.	0	0	0	0
67 Greenville	03/08/1998	02:35 PM	Tstm Wind	50 kts.	0	0	3K	0
68 Greenville	03/08/1998	03:30 PM	Hail	0.75 in.	0	0	0	0
69 Countywide	03/08/1998	10:30 AM	Flood	N/A	0	0	800K	0
70 Greenville	05/03/1998	03:55 PM	Tstm Wind	75 kts.	0	0	15K	0
71 Mc Kenzie	05/03/1998	08:30 PM	Hail	1.00 in.	0	0	0	0
72 Mc Kenzie	05/03/1998	09:45 PM	Hail	2.75 in.	0	0	10K	0
73 Georgiana	06/06/1998	12:40 AM	Tstm Wind	50 kts.	0	0	20K	0
74 ALZ051>053 - 055>064	09/25/1998	09:00 AM	Hurricane	N/A	1	0	174.2M	5.0M
75 Countywide	09/28/1998	10:30 AM	Flood	N/A	0	0	0	0
76 Mc Kenzie	03/03/1999	01:45 AM	Tstm Wind	50 kts.	0	0	10K	0
77 Georgiana	05/18/1999	04:55 PM	Hail	0.75 in.	0	0	0	0
78 South Portion	06/27/1999	05:50 PM	Flash Flood	N/A	0	0	3K	0
79 Mc Kenzie	08/09/1999	02:00 PM	Tstm Wind	50 kts.	0	0	2K	0
80 ALZ039 - 051>058 - 060	01/27/2000	10:00 PM	Sleet	N/A	0	0	0	0
81 Greenville	02/13/2000	02:40 PM	Hail	0.75 in.	0	0	0	0
82 Greenville	02/13/2000	02:40	Tstm Wind	50	0	0	5K	0

		PM		kts.				
83 Greenville	03/19/2000	05:40 PM	Tstm Wind	60 kts.	0	0	10K	0
84 ALZ039 - 051>064	07/01/2000	12:01 AM	Excessive Heat	N/A	0	0	0	0
85 Greenville	07/20/2000	05:15 PM	Tstm Wind	55 kts.	0	0	5K	0
86 Georgiana	08/27/2000	02:55 PM	Hail	0.75 in.	0	0	0	0
87 Forest Home	01/19/2001	09:50 AM	Tstm Wind	55 kts.	0	0	5K	0
88 Countywide	03/03/2001	12:00 PM	Flash Flood	N/A	0	0	10K	0
89 Oaky Streak	03/12/2001	01:05 PM	Tstm Wind	65 kts.	0	0	50K	0
90 Forest Home	03/12/2001	12:35 PM	Tstm Wind	50 kts.	0	0	10K	0
91 Greenville	06/14/2001	12:30 PM	Tstm Wind	55 kts.	0	0	5K	0
92 ALZ054>058 - 060	08/06/2001	04:00 AM	Tropical Storm	N/A	0	0	200K	0
93 Greenville	10/13/2001	08:15 PM	Tstm Wind	60 kts.	0	0	20K	0
94 Greenville	10/13/2001	08:45 PM	Tstm Wind	50 kts.	0	0	10K	0
95 Georgiana	11/24/2001	04:58 PM	Hail	1.00 in.	0	0	0	0
96 Georgiana	11/24/2001	05:08 PM	Tornado	F0	0	0	30K	0
97 Mc Kenzie	11/24/2001	05:42 PM	Tornado	F1	0	3	100K	0
98 Garland	11/24/2001	06:30 PM	Tornado	F0	0	0	10K	0
99 Greenville	11/24/2001	08:00 PM	Flash Flood	N/A	0	0	10K	0
100 ALZ051>062	01/02/2002	12:00	Winter Storm	N/A	0	0	0	0

		AM						
101 Mc Kenzie	10/29/2002	12:35 PM	Tstm Wind	50 kts.	0	0	5K	0
102 Georgiana	11/05/2002	12:00 PM	Tornado	F0	0	0	8K	0
103 Garland	12/24/2002	04:30 AM	Tstm Wind	50 kts.	0	0	5K	0
104 Greenville	03/13/2003	03:15 PM	Hail	1.75 in.	0	0	1K	0
105 Forest Home	04/25/2003	06:25 PM	Hail	0.75 in.	0	0	0	0
106 Georgiana	04/25/2003	07:00 PM	Hail	0.75 in.	0	0	0	0
107 Forest Home	05/02/2003	05:45 PM	Hail	0.75 in.	0	0	0	0
108 Greenville	05/02/2003	06:40 PM	Tstm Wind	50 kts.	0	0	25K	0
109 Oaky Streak	05/02/2003	07:20 PM	Hail	0.75 in.	0	0	0	0
110 Monterey	05/02/2003	10:35 PM	Hail	0.75 in.	0	0	0	0
111 Georgiana	05/03/2003	09:05 AM	Hail	0.75 in.	0	0	0	0
112 Greenville	08/06/2003	02:00 PM	Tstm Wind	50 kts.	0	0	8K	0
				TOTALS:	3	14	224.464M	9.000M

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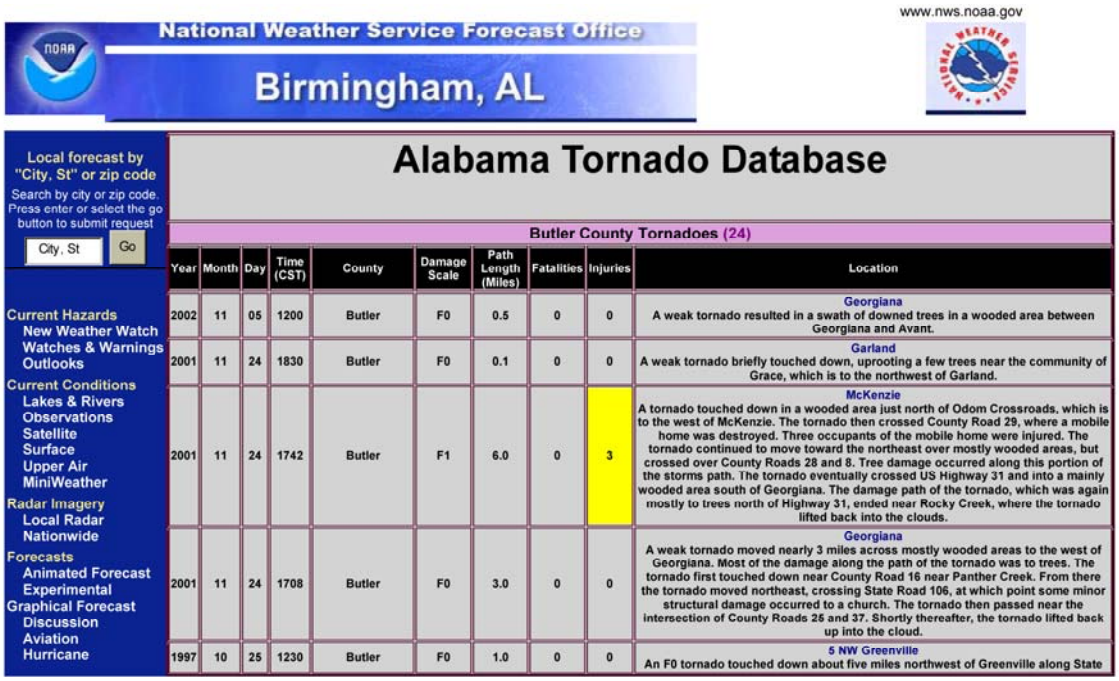
National Weather Service Forecast Office
Birmingham, AL
www.nws.noaa.gov
Local forecast by "City, St" or zip code
Search by city or zip code. Press enter or select the go button to submit request
City, St
Go
Current Hazards
New Weather Watch
Watches & Warnings
Outlooks
Current Conditions
Lakes & Rivers
Observations
Satellite
Surface
Upper Air
MiniWeather
Radar Imagery
Local Radar
Nationwide
Forecasts
Animated Forecast
Experimental
Graphical Forecast
Discussion
Aviation
Hurricane
Alabama Tornado Database
Butler County Tornadoes (24)
Year Month Day Time (CST) County Damage Scale Path Length (Miles) Fatalities Injuries Location
2002 11 05 1200 Butler F0 0.5 0 0 Georgiana
A weak tornado resulted in a swath of downed trees in a wooded area between Georgiana and Avant.
2001 11 24 1830 Butler F0 0.1 0 0 Garland
A weak tornado briefly touched down, uprooting a few trees near the community of Grace, which is to the northwest of Garland.
2001 11 24 1742 Butler F1 6.0 0 3 McKenzie
A tornado touched down in a wooded area just north of Odom Crossroads, which is to the west of McKenzie. The tornado then crossed County Road 29, where a mobile home was destroyed. Three occupants of the mobile home were injured. The tornado continued to move toward the northeast over mostly wooded areas, but crossed over County Roads 28 and 8. Tree damage occurred along this portion of the storms path. The tornado eventually crossed US Highway 31 and into a mainly wooded area south of Georgiana. The damage path of the tornado, which was again mostly to trees north of Highway 31, ended near Rocky Creek, where the tornado lifted back into the clouds.
2001 11 24 1708 Butler F0 3.0 0 0 Georgiana
A weak tornado moved nearly 3 miles across mostly wooded areas to the west of Georgiana. Most of the damage along the path of the tornado was to trees. The tornado first touched down near County Road 16 near Panther Creek. From there the tornado moved northeast, crossing State Road 106, at which point some minor structural damage occurred to a church. The tornado then passed near the intersection of County Roads 25 and 37. Shortly thereafter, the tornado lifted back up into the cloud.
1997 10 25 1230 Butler F0 1.0 0 0 5 NW Greenville
An F0 tornado touched down about five miles northwest of Greenville along State

Marine
Models
Fire Weather
Climate
Drought
Local Climate
Alabama Storm Data
El Niño / La Niña
Climate Prediction
Weather Safety
Storm Ready
Awareness
SKYWARN
More Topics
Site Index
Weather Desktop
Research
Kids
Calculator
About Our Office
Contact Us
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									Road 185. The tornado began about a mile west of State Road 185 and moved toward 185 then went back into the cloud near State road 185. The weak tornado skipped along the ground for about one mile and damage was about 150 yards wide along the track. Most of the damage was to trees. A metal garage along Highway 185 was the only structure to suffer major damage. No one was injured.
1995	10	4	1850	Butler	F0	0.1	0	0	Georgiana A tornado briefly touched down near Georgiana. Trees and pwoer lines were blown down.
1995	7	17	1305	Butler	F0	0.1	0	0	Foster Flats The public reported a tornado briefly touching down and damaging a building in the Foster Flats area.
1983	3	20	1310	Butler	F1	0.1	0	0	W Georgiana A small tornado touched down in the Providence Community with little or no damage.
1979	11	25	1220	Butler-Lowndes	F2	20.0	0	12	Near Greenville-Fort Deposit-Calhoun-Letohatchie Tornado touched down along highway 185 NW of Greenville, uprooting trees and disrupting electric power. It moved northeastward, touching down intermittently near Fort Deposit, Calhoun and Letohatchie in Lowndes County. 12 people were injured, 6 mobile homes were destroyed, 8 houses had roof damage and 1 barn was destroyed. Two separate funnels were reported by the public at Letohatchie.
1971	4	23	1140	Monroe-Butler	F3	15.0	0	0	Old Texas-Greenville Near total destruction occurred along the first 10 miles of the tornado path.
1969	4	18	0230	Montgomery-Bullock-Butler-Crenshaw	F4	57.0	2	15	Greenville-Panola-Fitzpatrick 2 people were killed as 18 homes were destroyed near Panola. Farm buildings were destroyed near Ramer. Several homes were damaged or destroyed near Fitzpatrick where injuries occurred. This may have been a family of tornadoes.
1964	12	26	1000	Butler	NA	NA	0	0	Brushey Creek Numerous farm buildings and one home were damaged.
1964	12	24	1020	Butler-Barbour	F2	5.0	0	0	Butler Springs-SW Forest Home A church and several homes were damaged or destroyed near the beginning of the path. Barns and chicken houses were also destroyed.
1964	10	4	1020	Butler	F2	3.0	0	0	2 SW Georgiana 2 homes were unroofed and 17 homes were damaged.
1964	4	28	1830	Butler	F2	3.0	0	0	2 SW Georgiana-Near Chapman 2 homes were unroofed. 17 homes and a fertilizer plant were damaged. Several barns were destroyed.
1957	6	28	1100	Conecuh-Covington-Butler	F2	12.0	0	2	1 SW Brooks-Oaky Streak Several homes were unroofed and a church was heavily damaged.
1957	6	28	1015	Butler	F2	11.0	0	0	6 SW Greenville-6 ENE Greenville Major damage was reported at Kolb City and at a junior college just southeast of town. A farm was damaged east of Greenville.
1957	6	28	0945	Conecuh-Butler	F2	25.0	0	0	10 W Evergreen-3 S Butler Springs At least 7 homes were destroyed. Several additional smaller homes were unroofed

									or overturned.
1947	1	30	1030	Conecuh-Butler	F3	15.0	3	30	Bethel-Shacklesville The village of Bethel was demolished. All the deaths and injuries occurred in Bethel.
1924	4	30	0450	Butler	F3	1.0	1	10	Greenville One well built home was destroyed. Other homes and businesses were unroofed.
1913	2	27	0645	Pike-Butler-Crenshaw	F2	45.0	3	4	N Greenville-N Troy 2 people were killed in Patsburg and one in Petrey. 40 buildings were damaged or destroyed in Troy.
1910	4	15	1130	Monroe-Wilcox-Butler	F2	25.0	1	20	Pineville-Awin At least 6 homes and 3 churches were demolished in Pineville. 14 of the 15 total homes in Awin were leveled and one person was killed.
1900	12	23	0230	Butler	F2	NA	0	3	4 W Greenville At least 4 barns and one home were destroyed.
1882	3	27	2000	Butler	F3	12.0	2	20	N Garland-3 S Georgiana At least 20 small homes were damaged or destroyed. A woman and a child were killed in separate homes.

Local Climate Water & Weather Topics:
Current Hazards, Current Conditions, Radar, Satellite, Climate, Weather Safety, Contact Us

National Weather Service
Birmingham, Alabama Weather Forecast Office
465 Weathervane Road
Calera, Alabama 35040
Contact Us
Page last modified: April 14, 2003

Digital Elevation Model

The digital elevation model (DEM) map for Butler County was prepared using data available from USGS.

A DEM is simply a digital map of elevation data. These maps, a type of DTM (Digital Terrain Model), are raster data meaning that they are made up of equally sized gridded cells each with a unique elevation.

Source:

Map Data Citation

Originators: National Aeronautics and Space Administration (NASA), National Imagery and Mapping Agency (NIMA), German Aerospace Center (DLR), and the Italian Space Agency (ASI)
Publication: 2002
Title: Shuttle Radar Topography Mission (SRTM) Elevation Dataset
Download Site: http://seamless.usgs.gov.

Abstract

The Shuttle Radar Topography Mission (SRTM) aboard the Space Shuttle Endeavour, launched on Feb. 11, 2000. SRTM used the same radar instrument that comprised the Spaceborne Imaging Radar-C/X-Band Synthetic Aperture Radar (SIR-C/X-SAR) that flew twice on the Space Shuttle Endeavour in 1994. SRTM was assigned to collect 3-D measurements of the Earth's surface. To collect the 3-D data, engineers added a 60-meter (approximately 200-foot) mast, installed additional C-band and X-band antennas, and improved tracking and navigation devices. The mission is a cooperative project between NASA, the National Imagery and Mapping Agency (NIMA) of the U.S. Department of Defense and the German and Italian space agencies. It is managed by NASA's Jet Propulsion Laboratory (JPL), Pasadena, CA, for NASA's Earth Science Enterprise, Washington, D.C.

Spatial Reference Information

Geographic Coordinate Units: Decimal degrees
Datum: D_WGS_1984
Ellipsoid: WGS_1984

Historical Tropical Cyclones

The historical tropical cyclones map for Butler County was prepared using data available from the National Oceanic and Atmospheric Administration (NOAA).

The map layer depicted on the map contains tracks of all North Atlantic, Caribbean, and Gulf of Mexico subtropical depressions and storms, tropical depressions and storms, and all hurricanes from 1851 through 2001. The storm tracks were created from observations of storm center locations taken every six hours.

Source:

Map Data Citation

Originator: National Oceanic and Atmospheric Administration, National Hurricane Center
Publication: May 2002
Title: Historical North Atlantic Tropical Cyclone Tracks
Download Site: http://nationalatlas.gov/hurallm.html.

Supplemental Information

General information on subtropical and tropical cyclones is available from the National Hurricane Center FAQ page at http://www.aoml.noaa.gov/hrd/tcfaq/tcfaqHED.html, and from the Hurricane Basics page at http://www.nhc.noaa.gov/HAW/basics/hurricane_basics.htm.

Spatial Reference Information

Geographic Coordinate Units: Decimal degrees
Datum: North American Datum of 1983
Ellipsoid: GRS1980

Land Use & Land Cover

The land use and land cover (LULC) map for Butler County was prepared using National Land Cover Data 1992 (NLCD 92) available from USGS.

NLCD 92 is a land cover classification scheme that has been applied consistently over the conterminous U.S. It is based primarily on the unsupervised classification of Landsat TM (Thematic Mapper) 1992 imagery. Ancillary data sources included topography, census, agricultural statistics, soil characteristics, other land cover maps, and wetlands data. The NLCD 92 classification is provided as raster data with a spatial resolution of 30 meters.

Source:

Map Data Citation

Originators: USGS
Publication: June 1999
Title: Alabama Land Cover Data Set
Download Site:
http://edcwww.cr.usgs.gov/programs/lccp/nationallandcover.html.

Supplemental Information

For descriptions of each classification, please visit
http://landcover.usgs.gov/classes.html.

Spatial Reference Information

Geographic Coordinate Units: Decimal degrees
Datum: North American Datum 1983
Ellipsoid: GRS 80

Landslide Incidence and Susceptibility

The landslide incidence/susceptibility map for Butler County was prepared by classifying geographic areas as having high, medium, and low susceptibility to landsliding.

Landslide incidence is defined as the number of landslides that have occurred in a given geographic area. Susceptibility to landsliding is defined as the probable degree of response of geologic formations to natural or artificial cutting, to loading of slopes, or to unusually high precipitation. Generally, it can be assumed that unusually high precipitation or changes in existing conditions can initiate landslide movement in areas where rocks and soils have experienced numerous landslides in the past.

The map units are split into three incidence categories according to the percentage of the area affected by landslides. All of Butler County is considered to have low incidence, which means that less than 1.5 percent of the areas have experienced landslides.

Sources:

Text description from "Landslides", a webpage provided by the Geological Survey of Alabama (GSA), and available from http://www.gsa.state.al.us/gsa/landslides.html. Accessed 1 May 2003.

The source for the map data is found below:

Map Data Citation

Originator: Jonathan W. Godt
Publication: February 2001
Title: Landslide Incidence and Susceptibility in the Conterminous United States
Other Citation Details:
These data were originally published as: Godt, J.W., 1997, Digital Representation of Landslide Overview Map of the Conterminous United States: U.S. Geological Survey Open-File Report 97-289, scale 1:4,000,000. Available online at http://landslides.usgs.gov/html_files/landslides/nationalmap/national.html.
Download Site: http://nationalatlas.gov/lsoverm.html.

Map Data Abstract

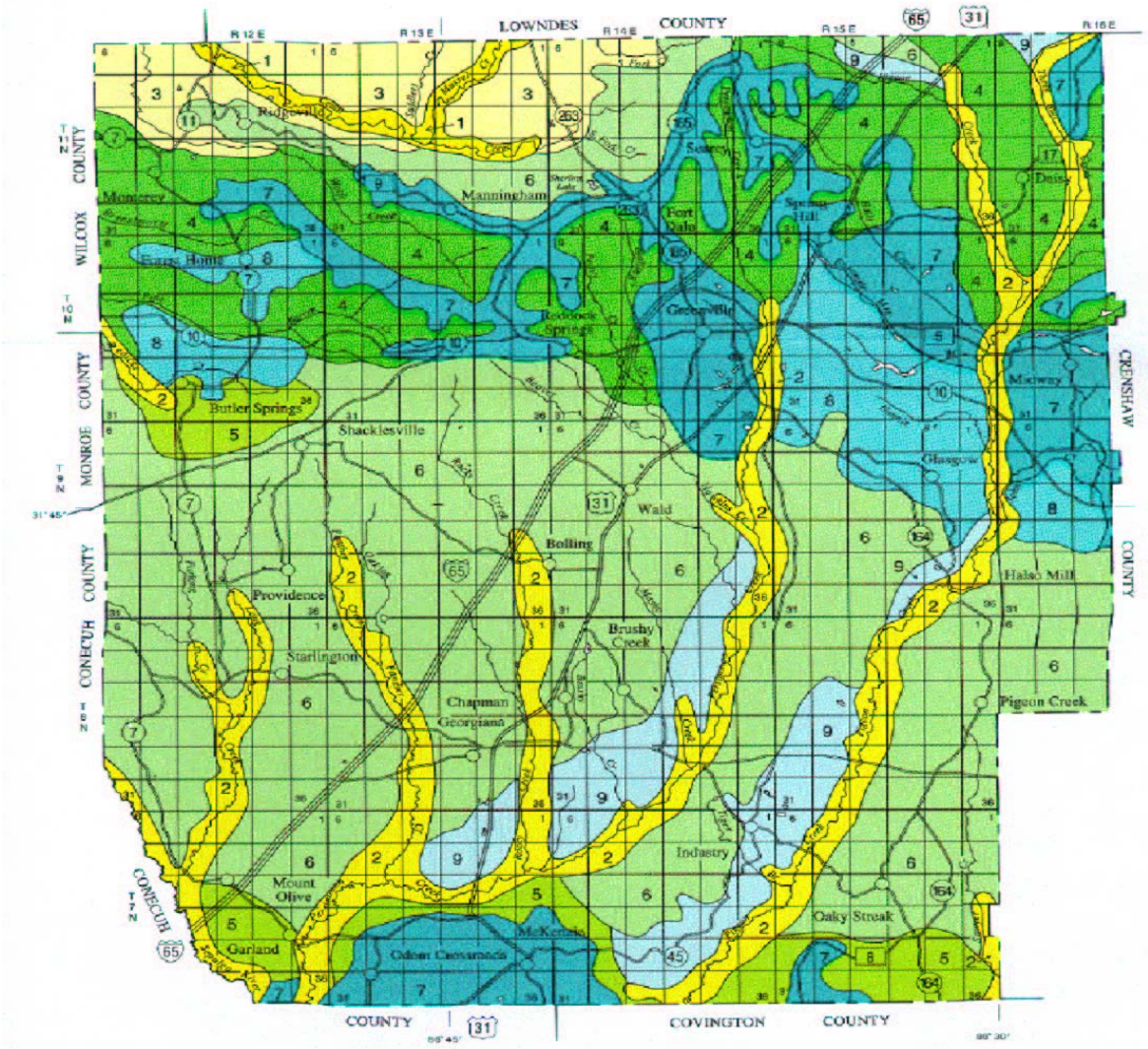
These data are a digital version of U.S. Geological Survey Professional Paper 1183, Landslide Overview Map of the Conterminous United States. The map and digital data delineate areas in the conterminous United States where large numbers of landslides have occurred and areas, which are susceptible to landsliding. Because the data are highly generalized, owing to the small scale and the scarcity of precise landslide

information for much of the country, they are unsuitable for local planning or actual site selection. This National Atlas data set was previously distributed as Digital Representation of the Landslide Overview Map of the Conterminous United States.

Spatial Reference Information
Geographic Coordinate Units: Decimal degrees
Datum: North American Datum of 1983
Ellipsoid: GRS1980

General Soils

Nine major soil associations exist within the boundaries of Butler County, Alabama. The following General Soil Map and general descriptions of soil associations are excerpts from the official *Soil Survey of Butler County, Alabama*, was last updated in 1997 and published on the Internet (http://soils.usda.gov/survey/online_surveys/alabama/butler/al_butler.pdf) by the USDA NRCS.



SOIL LEGEND*

1	Congaree-Leeper
2	Mantachie-Rains-Bethera
3	Dempolis-Searcy-Watsonia
4	Luverne-Troup-Smithdale
5	Arundel-Luverne
6	Luverne-Halso
7	Orangeburg-Malbis
8	Greenville-Orangeburg-Lucedale
9	Bonneau-Eunola-Benndale

*The units on this legend are described in the text under the heading "General Soil Map Units."

Compiled 1991

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

ALABAMA AGRICULTURAL EXPERIMENT STATION
ALABAMA SOIL AND WATER CONSERVATION COMMITTEE

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

GENERAL SOIL MAP
BUTLER COUNTY, ALABAMA

1 0 1 2 3 MILES

1 0 1 2 3 4 5 6 KILOMETERS

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Each map unit is rated for cultivated crops, pasture and hay, woodland, and urban uses. Cultivated crops are those grown extensively in the survey area. Pasture and hay refer to improved, locally grown grasses and legumes. Woodland refers to areas of native or introduced trees. Urban uses include residential, commercial, and industrial developments.

The boundaries of the general soil map units in Butler County were matched, where possible, with those of the previously completed surveys of Conecuh, Covington, and Monroe Counties. In a few areas, however, the lines do not join and the names of the map units differ. These differences result mainly because of changes in soil series concepts, differences in map unit design, and changes in soil patterns near survey area boundaries.

1. Congaree-Leeper

Nearly level, moderately well drained and somewhat poorly drained soils that have a loamy surface layer and a loamy substratum or a clayey subsoil; formed in loamy and clayey alluvial sediments

This map unit consists of soils on the flood plain of Cedar Creek in the northwestern part of the county. Areas are long and narrow in shape. The soils are frequently flooded, but the duration of flooding is brief. Slopes range from 0 to 1 percent. The natural vegetation consists of bottom land hardwoods.

This unit makes up about 1 percent of the county. It is about 70 percent Congaree soils, 25 percent Leeper soils, and 5 percent soils of minor extent.

The moderately well drained Congaree soils are on the higher, more convex parts of stream flood plains. The surface layer is dark brown loam. The substratum is dark yellowish brown loam in the upper part, brown and dark yellowish brown fine sandy loam in the next part, and brown loamy sand in the lower part.

The somewhat poorly drained Leeper soils are on the lower parts of stream flood plains. The surface layer is brown clay loam. The subsoil is dark grayish brown silty clay in the upper part and dark gray clay in the lower part. The substratum is gray silty clay that has brownish mottles.

Of minor extent in this map unit are Bibb, Iuka, Macon, and Mantachie soils. The poorly drained Bibb soils are in depressions. Iuka soils are on the high parts of natural levees. They have less clay in the substratum than the Congaree soils. Macon soils are on terraces. They are not flooded frequently. The somewhat poorly drained Mantachie soils are on the lower parts of natural levees. They are loamy throughout.

Most areas of this unit are used as woodland and wildlife habitat. A few areas are used for pasture.

The soils in this map unit are poorly suited to cultivated crops, pasture, and hay. The choice of crops and pasture plants and the period of grazing are limited by wetness and flooding.

This map unit is suited to the production of hardwoods. Pine trees can be grown in areas of Congaree soils. Leeper soils are generally not suited to pine trees because they are alkaline within a depth of 20 inches. Common trees include sweetgum, water oak, green ash, yellow poplar, and American sycamore. Frequent flooding and wetness limit the use of equipment and increase the seedling mortality rate.

The soils in this map unit are poorly suited to most urban uses because of the frequent flooding and wetness.

2. Mantachie-Rains-Bethera

Nearly level, somewhat poorly drained and poorly drained soils that have a loamy surface layer and a loamy or a clayey subsoil; formed in loamy and clayey sediments

This map unit consists of soils on flood plains and low terraces of the Sepulga River, Persimmon Creek, Pigeon Creek, and other major streams. Mapped areas are long and narrow in shape. Numerous old channel scars and small depressions are scattered throughout the map unit. The soils in this unit are subject to occasional or frequent flooding. Slopes range from 0 to 1 percent. The natural vegetation consists of bottom land hardwoods in the lower areas on the landscape and mixed hardwoods and pine in the higher areas.

The unit makes up about 9 percent of the county. It is about 38 percent Mantachie soils, 32 percent Rains soils, 20 percent Bethera soils, and 10 percent soils of minor extent.

The somewhat poorly drained Mantachie and similar soils are on low or intermediate parts of stream flood plains. They are subject to frequent flooding. The surface layer is dark grayish brown loam. The subsoil is mottled brownish and grayish loam in the upper part and gray clay loam in the lower part.

The poorly drained Rains soils are on low terraces adjacent to stream flood plains. They are subject to occasional flooding. The surface layer is dark gray sandy loam. The subsurface layer is light brownish gray sandy loam. The subsoil is light gray sandy clay loam in the upper part, grayish brown sandy clay loam in the next part, and gray sandy clay loam and clay loam in the lower part.

The poorly drained Bethera soils are in landscape positions similar to those of the Rains soils. They are subject to occasional flooding. The surface layer is dark grayish brown fine sandy loam. The subsoil is grayish brown clay loam and clay in the upper part, gray clay in the next part, and grayish brown clay in the lower part.

Of minor extent in this map unit are Bibb, Bonneau, Cahaba, Iuka, Eunola, and Lynchburg soils. The poorly drained Bibb soils are in depressions on flood plains. Bonneau, Cahaba, Eunola, and Lynchburg soils are on low terraces at slightly higher elevations than the Rains and Bethera soils. Bonneau soils have thick sandy surface and subsurface layers. The well drained Cahaba soils have a reddish subsoil. The moderately well drained Eunola soils have a brownish subsoil. Lynchburg soils are somewhat poorly drained. Iuka soils are on the high parts of flood plains, and they are moderately well drained.

Most areas of this unit are used as woodland and wildlife habitat. A few areas have been cleared and are used for pasture.

The soils in this map unit are poorly suited to cultivated crops, pasture, and hay. The choice of crops and pasture plants and the period of grazing are limited by wetness and flooding.

This map unit is suited to hardwood and pine trees. Common trees include water oak, sweetgum, green ash, slash pine, and loblolly pine. Flooding and wetness limit the use of equipment and increase the seedling mortality rate.

The soils in this map unit are poorly suited to most urban uses because of the flooding and wetness.

3. Demopolis-Searcy-Watsonia

Gently sloping to steep, shallow, well drained soils and very deep, moderately well drained soils that have a loamy or a clayey surface layer and a loamy or a clayey subsoil; formed in material weathered from soft limestone (chalk) and clayey sediments

The landscape generally has varied relief in areas of this map unit. It is dominated by narrow, gently sloping ridgetops and strongly sloping to steep side slopes on uplands. Narrow flood plains border incised, mostly intermittent streams. The landscape is dissected by a well-defined, branching drainage system. Slopes are generally short and complex, and they range from 2 to 35 percent. The natural vegetation consists of eastern redcedar in areas of Demopolis soils and loblolly pine and mixed hardwoods in areas of Searcy and Watsonia soils.

This map unit makes up about 4 percent of the county. It is about 47 percent Demopolis soils, 20 percent Searcy soils, 10 percent Watsonia soils, and 23 percent soils of minor extent.

The shallow, well drained Demopolis soils are on narrow ridgetops and on side slopes. The surface layer is dark grayish brown loam. The substratum is dark grayish brown loam that has many fragments of soft limestone and concretions of calcium carbonate. The next layer is soft limestone bedrock.

The very deep, moderately well drained Searcy soils are on broad ridges and on toe slopes. The surface layer is brown sandy clay loam. The subsoil is yellowish red clay loam and red clay in the upper part; mottled red, light brownish gray, and yellowish brown clay in the next part; and mottled strong brown, yellowish brown, and gray clay in the lower part.

The shallow, well drained Watsonia soils are on narrow ridgetops. The surface layer is brown clay. The subsoil is yellowish red clay in the upper part, yellowish brown clay in the next part, and light olive brown clay in the lower part. The substratum is soft limestone bedrock.

Of minor extent in this map unit are Brantley, Congaree, Leeper, Macon, Oktibbeha, and Sumter soils. The very deep Brantley and Oktibbeha soils are on side slopes.

Brantley soils are well drained. Oktibbeha soils are alkaline below a depth of 30 inches. Congaree and Leeper soils are on narrow flood plains and are subject to frequent flooding. The well drained Macon soils are on terraces. The moderately deep Sumter soils are in landscape positions similar to those of the Demopolis soils.

Most areas of this unit are used as woodland and wildlife habitat. A few areas are used for pasture and hay.

The soils in this map unit are poorly suited to cultivated crops, pasture, and hay. The complex slopes, droughtiness, the shallow depth to bedrock, poor tilth, and the severe hazard of erosion are the main limitations.

The soils in this unit are suited to woodland. The potential productivity of loblolly pine and slash pine is extremely high in areas of Searcy soils and high in areas of Watsonia soils. Demopolis soils are not suited to pine trees because they are alkaline throughout the profile. Common trees include loblolly pine, longleaf pine, shortleaf pine, eastern redcedar, water oak, and sweetgum. The slope and clayey textures limit the use of logging equipment in steep areas. Erosion is a hazard along logging roads, landings, and skid trails. Droughtiness increases the seedling mortality rate in areas of Demopolis and Watsonia soils.

The soils in this map unit are poorly suited to most urban uses. The depth to rock, the shrink-swell potential, and the very slow permeability in the Demopolis and Watsonia soils and the wetness and the shrink-swell potential in the Searcy soils are limitations for most uses. The slope is a limitation for most urban uses in some areas.

4. Luverne-Troup-Smithdale

Gently sloping to steep, well drained and somewhat excessively drained soils that have a loamy or a sandy surface layer and a clayey or a loamy subsoil; formed in clayey, sandy, and loamy sediments

The landscape generally has varied relief in areas of this map unit. It is dominated by narrow to broad, gently sloping ridgetops and strongly sloping to steep side slopes on uplands. Narrow flood plains border incised, intermittent and perennial streams. The landscape is dissected by a well-defined, branching drainage system. Slopes are short and complex, and they range from 2 to 35 percent. The natural vegetation consists of pine and mixed hardwoods.

This map unit makes up about 16 percent of the county. It is about 30 percent Luverne soils, 25 percent Troup soils, 20 percent Smithdale soils, and 25 percent soils of minor extent.

The well drained Luverne soils are on narrow ridgetops and on side slopes. The surface layer is brown sandy loam. The subsurface layer is light yellowish brown sandy loam. The subsoil is yellowish red clay and sandy clay in the upper part and yellowish red clay loam in the lower part. The substratum is thinly stratified, yellowish red sandy loam, light gray clay, and strong brown sandy clay loam.

The somewhat excessively drained Troup soils are on the higher ridgetops and the upper parts of side slopes. The surface layer is dark brown loamy sand. The subsurface layer is yellowish red loamy sand. The subsoil is yellowish red sandy loam.

The well drained Smithdale soils are on the middle and upper parts of side slopes. The surface layer is dark grayish brown sandy loam. The subsurface layer is yellowish red sandy loam. The subsoil is red sandy clay loam in the upper part and red sandy loam in the lower part.

Of minor extent in this map unit are Alaga, Bibb, Iuka, Lucy, Mantachie, and Orangeburg soils. Alaga and Lucy soils are in landscape positions similar to those of the Troup soil. Alaga soils are sandy to a depth of 80 inches or more. Lucy soils have sandy surface and subsurface layers that range from 20 to 40 inches thick. Bibb, Iuka, and Mantachie soils are on narrow flood plains and are subject to frequent flooding. Orangeburg soils are on the high parts of ridgetops. They do not have thick sandy surface and subsurface layers, and they are loamy throughout the profile.

Most areas of this unit are forested. Areas that are used for cultivated crops, pasture, or hay or as sites for homes are scattered throughout the map unit, mainly on the broad ridgetops.

The soils in this map unit are poorly suited to cultivated crops and are suited to pasture and hay. Low fertility, complex slopes, and droughtiness are the main limitations. Erosion is a hazard if the soils are tilled. Applications of lime and fertilizer are needed for crops and pasture plants. Conservation tillage, terraces, grassed waterways, cover crops, and contour farming are management practices that help to maintain productivity and control erosion.

The soils in this unit are suited to woodland. The potential productivity of loblolly pine and slash pine is high. Common trees include loblolly pine, longleaf pine, shortleaf pine, southern red oak, sweetgum, and water oak. The slope limits the use of logging equipment in steep areas. Erosion is a hazard along logging roads, landings, and skid trails. The sandy texture of the Troup soils hinders the use of wheeled equipment, especially when the soils are very dry. Droughtiness increases the seedling mortality rate in areas of Troup soils.

The soils in this map unit are poorly suited to most urban uses. The slope is a limitation for most urban uses in some areas. The moderately slow permeability and moderate shrink-swell potential in the Luverne soils are limitations for some uses.

5. Arundel-Luverne

Gently sloping to steep, moderately deep and very deep, well drained soils that have a loamy surface layer and a clayey subsoil; formed in clayey sediments overlying claystone and in stratified clayey and loamy sediments

The landscape generally has varied relief in areas of this map unit. It is dominated by narrow to broad, gently sloping ridgetops and strongly sloping to steep side slopes on uplands. Narrow flood plains border incised, intermittent and perennial streams. The landscape is dissected by a well-defined, branching drainage system. Slopes are short and complex, and they range from 1 to 35 percent.

This map unit makes up about 5 percent of the county. It is about 65 percent Arundel soils, 15 percent Luverne soils, and 20 percent soils of minor extent.

The moderately deep Arundel soils are on narrow ridgetops and on side slopes. The surface layer is brown fine sandy loam. The subsoil is yellowish brown clay loam and strong brown clay in the upper part and dark yellowish brown clay in the lower part. The substratum is weathered claystone.

The very deep Luverne soils are on the lower parts of side slopes. The surface layer is brown sandy loam. The subsurface layer is light yellowish brown sandy loam. The subsoil is yellowish red clay and sandy clay in the upper part and yellowish red clay loam in the lower part. The substratum is thinly stratified, yellowish red sandy loam, light gray clay, and strong brown sandy clay loam.

Of minor extent in this map unit are Bibb, Halso, Iuka, Orangeburg, and Smithdale soils. The poorly drained Bibb and moderately well drained Iuka soils are on narrow flood plains and are subject to frequent flooding. Halso soils are in slightly higher positions than the Arundel soils and are deep over shale bedrock. Orangeburg soils are on high ridgetops and are loamy throughout the profile. Smithdale soils are in landscape positions similar to those of the Luverne soils. They are loamy throughout the profile.

Most areas of this unit are forested. Areas that are used for pasture or hay or as sites for homes are scattered throughout the map unit, mainly on broad ridgetops.

The soils in this map unit are poorly suited to cultivated crops and are suited to pasture and hay. The slope, the low fertility, the poor tilth, and the hazard of erosion are the main limitations. Applications of lime and fertilizer are needed for crops and pasture plants. Conservation tillage, terraces, grassed waterways, cover crops, and contour farming are management practices that are necessary to maintain productivity and control erosion.

The soils in this map unit are suited to woodland. The potential productivity of loblolly pine and slash pine is high. Common trees include loblolly pine, shortleaf pine, sweetgum, and water oak. The slope limits the use of logging equipment in steep areas. Erosion is a hazard along logging roads, landings, and skid trails. The low strength of the clayey subsoil limits the use of wheeled equipment when the soils are wet.

The soils in this map unit are poorly suited to most urban uses. The slope is a limitation for most urban uses in some areas. The depth to rock, the high shrink-swell potential, and the very slow permeability in the Arundel soils and the moderately slow permeability and moderate shrink-swell potential in the Luverne soils are limitations for some uses.

6. Luverne-Halso

Nearly level to strongly sloping, very deep and deep, well drained and moderately well drained soils that have a loamy surface layer and a clayey subsoil; formed in stratified clayey and loamy sediments and in clayey sediments overlying shale

The landscape generally has varied relied in areas of this map unit. It is dominated by narrow to broad, nearly level to gently sloping ridgetops and strongly sloping side slopes on uplands. Narrow flood plains border incised, intermittent and perennial streams. The landscape is dissected by a well-defined, branching drainage system. Slopes range from 1 to 15 percent. The natural vegetation consists of pine and mixed hardwoods.

This map unit makes up about 40 percent of the county. It is about 50 percent Luverne soils, 25 percent Halso soils, and 25 percent soils of minor extent.

The very deep, well drained Luverne soils are on the higher ridgetops and on the lower parts of side slopes. The surface layer is brown sandy loam. The subsurface layer is light yellowish brown sandy loam. The subsoil is yellowish red clay and sandy clay in the upper part and yellowish red clay loam in the lower part. The substratum is thinly stratified, yellowish red sandy loam, light gray clay, and strong brown sandy clay loam.

The deep, moderately well drained Halso soils are on broad ridgetops at slightly lower elevations than the Luverne soils. The surface layer is brown silt loam. The subsoil is dark reddish brown clay in the upper part and red clay in the lower part. The substratum is light brownish gray clayey shale and light yellowish brown clay loam in the upper part and light brownish gray clayey shale in the lower part.

Of minor extent in this map unit are Arundel, Bibb, Malbis, and Orangeburg soils. Arundel soils are in landscape positions similar to those of the Halso soils. They are moderately deep over claystone bedrock. The poorly drained Bibb soils are on narrow flood plains. Malbis and Orangeburg soils are on the higher parts of ridgetops. They are loamy throughout the profile.

Most areas of this map unit are forested. Areas that are used for cultivated crops, pasture, or hay or as sites for homes are scattered throughout the map unit, mainly on the higher ridgetops.

The soils in this map unit are suited to cultivated crops and are well suited to pasture and hay. Low fertility, poor tilth, and the hazard of erosion are the main limitations. Applications of lime and fertilizer are needed for crops and pasture plants. Conservation tillage, terraces, grassed waterways, cover crops, and contour farming are management practices that are necessary to maintain productivity and control erosion.

The soils in this map unit are well suited to woodland. The potential productivity of loblolly pine and slash pine is very high. Common trees include sweetgum, water oak, loblolly pine, longleaf pine, and shortleaf pine. The low strength of the clayey subsoil restricts the use of equipment when the soils are wet. Erosion is a hazard along logging roads, landings, and skid trails.

The soils of this map unit are poorly suited to most urban uses. The main limitations are the very slow permeability and high shrink-swell potential in Halso soils and the moderately slow permeability and moderate shrink-swell potential in Luverne soils. In some areas, the slope is a limitation for some uses.

7. Orangeburg-Malbis

Nearly level to moderately sloping, well drained soils that have a loamy surface layer and a loamy subsoil; formed in loamy sediments

The landscape generally has slight to moderate relief in areas of this map unit. It is dominated by broad, nearly level to gently sloping ridgetops and gently sloping to moderately sloping side slopes on uplands. Narrow flood plains border incised, mostly intermittent streams. Slopes are generally long and smooth, and they range from 1 to 8 percent. The natural vegetation consists of pine and mixed hardwoods.

This map unit makes up about 13 percent of the county. It is about 75 percent Orangeburg soils, 10 percent Malbis soils, and 15 percent soils of minor extent.

Orangeburg soils are on the higher, more convex parts of broad ridgetops and on the upper parts of side slopes. The surface layer is dark brown and yellowish brown sandy loam. The subsoil is yellowish red sandy clay loam in the upper part and red sandy clay loam in the lower part.

Malbis soils are on slightly lower, less convex parts of broad ridgetops and on long, smooth side slopes. The surface layer is brown and yellowish brown fine sandy loam. The subsoil is yellowish brown sandy clay loam in the upper part; brownish yellow sandy clay loam that has reddish mottles and plinthite in the next part; and mottled brown, red, and light brownish gray sandy clay loam in the lower part.

Of minor extent in this map unit are Bibb, Iuka, Lucy, Luverne, and Troup soils. The poorly drained Bibb and moderately well drained Iuka soils are on narrow flood plains. Lucy and Troup soils are on the higher parts of narrow ridges, and they have thick sandy surface and subsurface layers. Luverne soils are on the lower parts of ridges and side slopes. They are clayey in the upper part of the subsoil.

Most areas of this map unit are used for cultivated crops, pasture, or hay. A significant acreage is forested or is used as sites for homes. Corn, cotton, soybeans, grain sorghum, and wheat are the main crops. Most of the forested areas in this unit are on the moderately sloping side slopes along drainageways and on narrow flood plains.

The soils in this map unit are suited to cultivated crops and are well suited to pasture and hay. Low fertility and the hazard of erosion are the main limitations. Applications of lime and fertilizer are needed for crops and pasture plants. Conservation tillage, terraces, grassed waterways, cover crops, and contour farming are management practices that help to maintain productivity and control erosion.

The soils in this map unit are well suited to woodland. The potential productivity of loblolly pine and slash pine is very high. Common trees include loblolly pine, longleaf pine, shortleaf pine, southern red oak, water oak, sweetgum, and hickory. The soils in this unit have few limitations for use as woodland; however, erosion is a concern along logging roads, landings, and skid trails.

The soils in this map unit are well suited to most urban uses. The moderate to moderately slow permeability is a limitation for some uses.

8. Greenville-Orangeburg-Lucedale

Nearly level to strongly sloping, well drained soils that have a loamy surface layer and a clayey or loamy subsoil; formed in clayey and loamy sediments

The landscape generally has slight to moderate relief in areas of this map unit. It consists of gently rolling uplands that have broad, convex ridgetops, gentle side slopes, and broad flats. It is dissected by a well-defined, branching drainage system. Slopes are long and smooth, and they range from 0 to 15 percent. The natural vegetation consists of mixed hardwoods and pine.

This map unit makes up about 6 percent of the county. It is about 58 percent Greenville soils, 15 percent Orangeburg soils, 9 percent Lucedale soils, and 18 percent soils of minor extent.

Greenville soils are on broad, nearly level ridgetops and on gently sloping to strongly sloping side slopes. The

surface layer is dark reddish brown sandy loam. The subsoil is dark red clay.

Orangeburg soils are on slightly higher, narrow to broad, nearly level to gently sloping ridgetops and on gently sloping to moderately sloping side slopes. The surface layer is dark brown and yellowish brown sandy loam. The subsoil is yellowish red sandy clay loam in the upper part and red sandy clay loam in the lower part.

Lucedale soils are on broad, nearly level ridgetops. The surface layer is dark reddish brown sandy loam. The subsoil is dark red loam in the upper part and dark red sandy clay loam in the lower part.

Of minor extent in this map unit are Bibb, Iuka, Lucy, Luverne, Rains, and Troup soils. The poorly drained Bibb and moderately well drained Iuka soils are on narrow flood plains. Lucy and Troup soils are on higher parts of narrow ridges, and they have thick sandy surface and subsurface layers. Luverne soils are on the lower parts of ridges and side slopes. They are clayey in the upper part of the subsoil. The poorly drained Rains soils are in depressions on broad ridgetops.

Most areas of this map unit are used for cultivated crops, pasture, or hay. Scattered areas are used as sites for homes. Most of the forested areas in this unit are on the strongly sloping side slopes along drainageways and on narrow flood plains.

The soils in this map unit are well suited to cultivated crops, pasture, and hay. The low fertility and the hazard of erosion are the main limitations. Applications of lime and fertilizer are needed for crops and pasture plants. Conservation tillage, terraces, grassed waterways, cover crops, and contour farming are management practices that help to maintain productivity and control erosion.

The soils in this map unit are well suited to woodland. The potential productivity of loblolly pine and slash pine is high. Common trees include loblolly pine, longleaf pine, shortleaf pine, southern red oak, water oak, sweetgum, and hickory. The soils in this unit have few limitations for use as woodland.

The soils in this map unit are well suited to most urban uses. The slope is a limitation in some areas.

9. Bonneau-Eunola-Benndale

Nearly level to moderately sloping, well drained and moderately well drained soils that have a sandy or a loamy surface layer and a loamy subsoil; formed in sandy and loamy sediments

This map unit consists of soils on stream terraces that are parallel to Persimmon Creek and Pigeon Creek in the southern part of the county. The soils in this unit are subject to rare flooding or are not subject to flooding. The landscape generally has slight to moderate relief in areas of this map unit. It consists of broad flats and gentle side slopes. It is dissected by a well-defined, branching drainage system. Slopes are long and smooth, and they range from 0 to 8 percent.

This map unit makes up about 6 percent of the county. It is about 40 percent Bonneau soils, 25 percent Eunola soils, 10 percent Benndale soils, and 25 percent soils of minor extent.

The well drained Bonneau soils are on the higher parts of ridges and on side slopes. The surface layer is grayish brown loamy sand. The subsurface layer is brown and brownish yellow loamy sand. The subsoil is light olive brown and olive yellow sandy clay loam in the upper part and yellowish brown sandy clay loam in the lower part.

The moderately well drained Eunola soils are on low terraces and are subject to rare flooding. The surface layer is brown sandy loam. The subsoil is yellowish brown sandy clay loam in the upper part, yellowish brown sandy clay loam that has light brownish gray and yellowish red mottles in the next part, and yellowish brown sandy loam in the lower part. The substratum is yellowish brown sand.

The well drained Benndale soils are on nearly level to gently sloping, broad ridgetops. The surface layer is dark brown sandy loam. The subsoil is yellowish brown sandy loam in the upper part and brownish yellow sandy loam in the lower part.

Of minor extent in this map unit are Bibb, Cahaba, Lynchburg, and Rains soils. The poorly drained Bibb soils are on narrow flood plains. The well drained Cahaba soils are in slightly higher, more convex positions on low terraces than the Eunola soils. The somewhat poorly drained Lynchburg and poorly drained Rains soils are in slightly lower, less convex positions than the Bonneau, Benndale, or Eunola soils.

Most areas of this unit are used for cultivated crops, pasture, or hay. Forested areas are scattered throughout the map unit, mainly on the steeper slopes adjacent to drainageways and on narrow flood plains.

The soils in this map unit are well suited to cultivated crops, pasture, and hay. The main limitations are the low fertility, the droughtiness of the Bonneau soils, and the wetness of the Eunola soils. Erosion is a hazard in the sloping areas. Applications of lime and fertilizer are needed for crops and pasture. Conservation tillage, grassed waterways, contour farming, and cover crops are management practices that minimize soil losses from erosion.

The soils in this map unit are well suited to woodland. The potential production of loblolly pine and slash pine is very high. Common trees include loblolly pine, longleaf pine, shortleaf pine, yellow poplar, sweetgum, and water

oak. The sandy texture of Bonneau soils hinders the use of wheeled equipment, especially when the soils are very dry. Soil droughtiness increases the seedling mortality rate in areas of Bonneau soils.

The soils in this map unit are generally suited to most urban uses. Flooding is a limitation for most uses in areas of Eunola soils. The seasonal high water table in the Bonneau and Eunola soils is a limitation for some uses.

Table 4.--Suitability and Limitations of General Soil Map Units for Specified Uses

Map unit	Extent of area	Cultivated crops	Pasture and hay	Woodland	Urban uses
	Pct				
1. Congaree-Leeper	1	Poorly suited: wetness, flooding.	Poorly suited: wetness, flooding.	Suited: wetness, flooding, restricted use of equipment, seedling mortality.	Poorly suited: wetness, flooding.
2. Mantachie-Rains-Bethera	9	Poorly suited: wetness, flooding.	Poorly suited: wetness, flooding.	Suited: wetness, flooding, restricted use of equipment, seedling mortality.	Poorly suited: wetness, flooding.
3. Demopolis-Searcy-Watsonia	4	Poorly suited: slope, droughtiness, hazard of erosion.	Poorly suited: slope, droughtiness.	Suited: restricted use of equipment, hazard of erosion, seedling mortality.	Poorly suited: slope, depth to rock, shrink-swell potential, slow and very slow permeability.
4. Luverne-Troup-Smithdale	16	Poorly suited: slope, low fertility, hazard of erosion.	Suited: slope, low fertility, droughtiness.	Suited: restricted use of equipment, hazard of erosion, seedling mortality.	Poorly suited: slope, moderate and moderately slow permeability, low strength, shrink-swell potential.
5. Arundel-Luverne	5	Poorly suited: slope, low fertility, hazard of erosion.	Suited: slope, low fertility.	Suited: restricted use of equipment, hazard of erosion.	Poorly suited: slope, shrink-swell potential, moderately slow and very slow permeability.
6. Luverne-Halso	40	Suited: low fertility, hazard of erosion.	Well suited	Well suited	Poorly suited: slope, shrink-swell potential, moderately slow and very slow permeability.
7. Orangeburg-Malbis	13	Suited: low fertility, hazard of erosion.	Well suited	Well suited	Well suited.

Table 4.--Suitability and Limitations of General Soil Map Units for Specified Uses--Continued

Map unit	Extent of area	Cultivated crops	Pasture and hay	Woodland	Urban uses
	Pct				
8. Greenville-Orangeburg-Lucedale-	6	Well suited---	Well suited---	Well suited-----	Well suited.
9. Bonneau-Eunola-Benndale----------	6	Well suited---	Well suited---	Well suited-----	Suited: wetness, flooding.